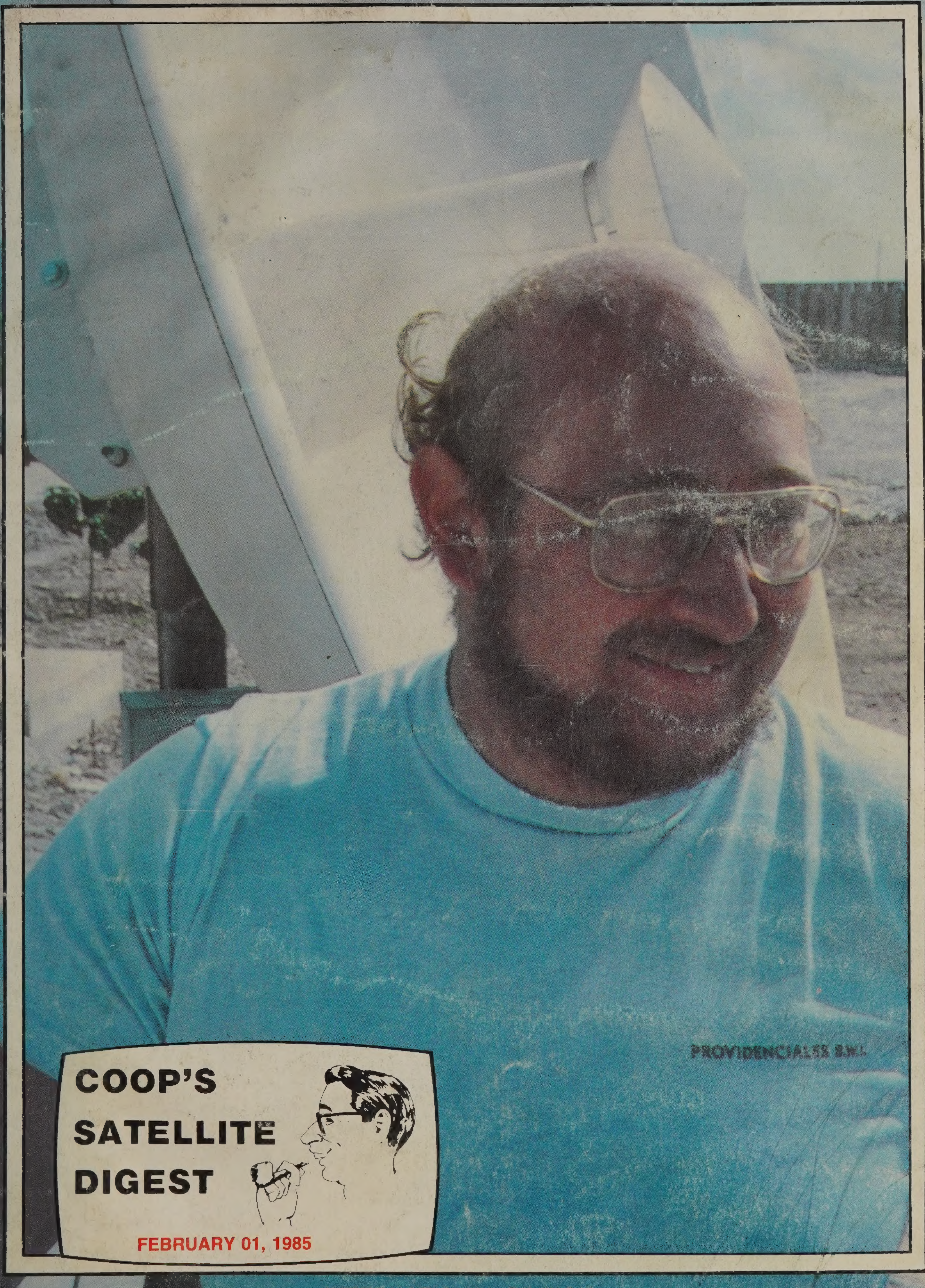

PROVIDENCIALES B.W.I.

COOP'S SATELLITE DIGEST

FEBRUARY 01, 1985

INTERNATIONAL EDITION

AVCOM'S satellite receivers continue to make me look good.

My customers get studio-quality satellite reception. And, I get all the credit.

Because AVCOM receivers live up to their performance specifications and have such high reliability, you benefit from the resulting customer satisfaction.

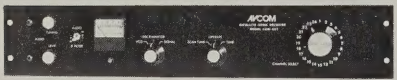
Ask any AVCOM dealer about AVCOM'S excellent reputation for products that work right from the carton. The first time. Every time.

Compare AVCOM'S video quality to the competition. It's unsurpassed. Carefully designed commercial-grade circuitry makes the AVCOM picture possible.

AVCOM. It means Value. Reliability. And, Service. As an AVCOM dealer it means AVCOM'S commitment to your success.

AVCOM Lets you profit from both the commercial and the home-use markets.

AVCOM is a leading designer and manufacturer of unique satellite communications products for both commercial and private installations. For example:



COM-66T: A commercial receiver that features a detented channel selector and is compatible with AVCOM'S BDC-60 block downconverter. The result is a double conversion system that offers high stability and can be used with any brand and degree LNA. Other features include; automatic polarity switching output, tunable audio, sensitive signal meter and rack mount.

COM-2A: The ultimate in Convenience, Economy and Performance. Attractive styling fits any home decor. Ideally suited for low cost installations and delivers maximum reliability and high performance. Features include;

- Attractive styling
- Tunable audio with switchable wide and narrow IF filters (optional)
- Remote control console
- Internal crystal controlled modulator
- Unclamped video output for decoders

COM-3R: Now with APS-24 Auto-Polarization Selector standard. The full feature COM-3R is used around the world for a wide variety of unique TVRO installations. Threshold peaking and selectable dual IF filters are optionally available for receiving international type transmissions.

Call your AVCOM representative today. It's a sure way to continue looking good.

AVCOM®

500 Research Road.
Richmond, VA 23236
(804)794-2500
Toll Free Order-Only Line
800-446-2500

TOP OF THE MONTH

SMALL antennas, according to the majority of those hundreds questioned for our **CSD/2** January 15th issue, will become a 'significant part of TVRO' selling during 1985. We look at 'the two' problems with small antennas in this issue; a shortage of gain, and, their ability to 'separate' 4 GHz satellites spaced only 2 degrees apart in the Clarke Orbit Belt.

SYSTEM testing; using specialized test equipment created for TVRO, is coming. Newton has been offering 'test sets' for a couple of years and we begin our investigation of test equipment by checking out Newton units, this issue.

SURVIVAL. It's on everyone's mind. 1985 is predicted to be a year of 'great change' (**see** CSD/2 **for January 15th**). We ponder the depth of these changes in Coop's Comments this month and talk about some of the obvious improvements still needed in the 'equipment' area.

TESTING This month we look at the Ranger 11 foot screen mesh dish after subjecting it to a '90 day break-in' period at our Turks and Caicos Test Lab. In 'Comments, some additional thoughts about 'testing systems.'

RUSSIA'S use of Gorizont is changing in subtle ways as our 'Eastern Sky Report' shows. And Canada discovers they have more satellite capacity than they can afford, as Mark Lewis reports.

FEBRUARY 01 1985

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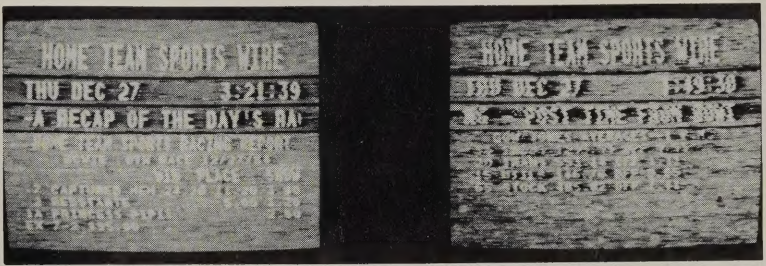

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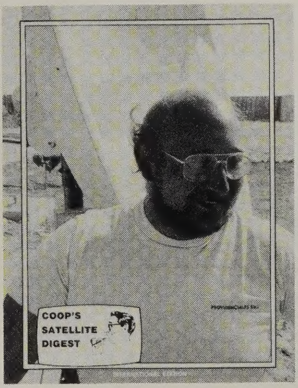

OUR COVER/ **Paul Gagliano** designs 'new generation' fiber-material dishes for **Southern Star Satellite Antennas** out of St. Petersburg, Florida. He's onto-something regarding better gain and 2 degree spacing as we find out on page 8 here.

COOP'S
SATELLITE
DIGEST
International Edition

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SATELLITE TV SYSTE
THEY'RE IN A CLAS

"Microwave Specialty Corporation has range tested the (Conifer) AN1200 Micro-Grid twelve foot aluminum reflector with a Polarotor I™ Feed. Test patterns indicate...side lobes of less than 18 db and 1.4° beamwidth will provide normal satellite receive signals. This normal antenna performance would be inclusive of operations at the eventual planned 2° satellite spacings.

Microwave Specialty is an independent test lab having no financial or administrative connection with Conifer Corporation."
Microwave Specialty Company Duane Tubbs, Chief Engineer.

MS FROM CONIFER
S BY THEMSELVES

Conifer has been a pioneer in developing satellite TV systems for the dealer that ensure simplicity in purchasing, quick installation, and easy servicing. Our "Total System" and "Dealer Ready" concepts combining "matched components" were industry firsts! Today, Conifer satellite TV systems are recognized throughout the industry for their engineering innovations and design.

Conifer's "Total System" concept includes our 12-foot mesh dish, 100-degree LNA, full featured receiver and all hardware and wire.

The ultimate measure of the value of Conifer's satellite TV system is the quality of the picture received on the TV set. Conifer satellite TV reception is sharp with studio quality, color clarity. Our satellite systems were designed to provide the maximum amount of signal with the least amount of interference. And, Conifer's system will work perfectly under 2° spacing conditions.

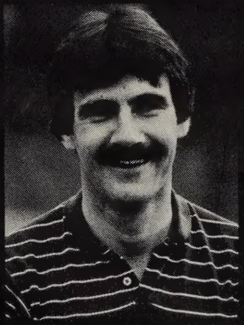
Besides engineering and design innovations Conifer has become known for its service to our customers. The highest compliments a satellite TV system manufacturer can receive are endorsements from some of the top satellite dealers from around the country who buy with confidence from Conifer.

Conifer has been built on many successful years in electronics and antenna engineering and manufacturing. We're dedicated to providing our customers with the best price value and service in the TVRO industry. Conifer satellite systems make the difference!

THERE ARE VERY GOOD REASONS WHY TOP SATELLITE DEALERS BUY CONIFER

CHARLIE BROWN — Owner
Lefler and Brown TV — Knoxville, Illinois
SATELLITE DEALER MAGAZINE
"Dealer of the Month for May 1984"
SATELLITE TV OPPORTUNITIES MAGAZINE
"Dealer of the Year for 1983"
SPACE Dealer Board of Directors

"Conifer has the features I want to sell. Everything is contained in one unit...I think Conifer has the best mesh system on the market."



WAYNE MORONG — President
Harbor Audio Video — Camden, Maine
SATELLITE DEALER MAGAZINE
"Dealer of the Month for January 1984"
SPACE Dealer Board of Directors

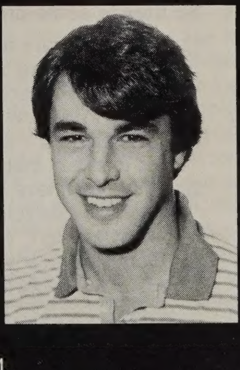
"I've looked at other types of mesh antennas and Conifer's impressed me as an easier package to get out into the field, of all the mesh antennas it's the best!"

WES HUNTER Owner
Hunter TV & Satellite Inc. — Muscatine, Iowa
SPACE Dealer

"We really can't say enough about how well the people at Conifer treat us. They're a service oriented company ...I've never dealt with a company that has given us such consideration."

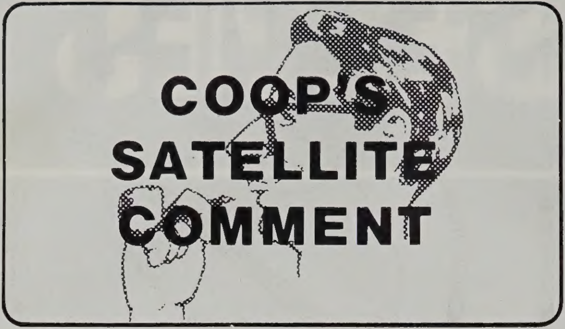
PAUL GIBERTI — Owner
Celestial Communications, Inc. CELCOM — Whitman, Massachusetts
SPACE Dealer

"Conifer's performance is the best of any mesh satellite dish... As far as I'm concerned Conifer is commercial quality."



CONIFER®

CONIFER CORPORATION • P.O. Box 1025 • 1400 N. Roosevelt • Burlington, IA 52601
TOLL FREE NUMBER 1-800-358-3058 In Iowa Call (319) 752-3607
STOP BY and SEE US at the SPACE/STTI Las Vegas Show, booth 1331.



- **MORE/ Who Will Survive?**
- **TESTING Facilities**
- **THE Show Ahead**

THE 'Next Show'

The last thing the forthcoming STTI/SPACE show in Las Vegas needs is 'hype.' There was a procedure which the show organizers were supposed to follow in announcing and making available booth display space. Somehow the procedure got mixed and within hours of accepting sign-ups during the Dallas show, every available booth had been snapped up. No show in the history of the industry ever sold out 'within hours' previously.

If 'bigger' and 'better' impresses you, everything about the early April gathering will be impressive. A new Las Vegas facility (new to TVRO), a now well-honed relationship between SPACE and STTI (after a complete working relationship in Nashville and a partial working relationship in Dallas), and a renewed effort to make the program 'meaningful' all point towards a show to top every show this industry has ever held in the past.

The amount of totally new equipment being designed for Las Vegas unveiling is awesome. New receiver designs, new feed designs, new antenna designs . . . you name it, and Las Vegas will be both an unveiling and probably a turning point in industry technology.

But perhaps the most dramatic impact of Vegas in '85 will be in the person of those pin-striped suit attendees who will be invading the Las Vegas show in record numbers, representing major chain stores and major consumer outlets coast-to-coast. The video-seller trade-publications are quite filled with good words about home TVRO and they have made quite a bit of the 1984 legislation adopted in October. It is obvious to me that the **Macys** and the **K-Marts** and the audio-video chains will be out in force inspecting the hardware and making preliminary system packaging and buying decisions.

Which brings me to the point of these comments. Much of the literature which we hand out at trade shows looks as if it were run-off in the backroom of the local one hour Qwik-Print. Most, but not all. There are many fine products out there which are fine **inspite-of** the less-than-classy look of their literature.

Booth displays stop people. **Booth sales people** engross people. But the sales literature, the manuals, the data sheets we hand out so prolifically at trade shows goes home with people who in turn write reports about what they saw and did and they hand those reports (with atachments) on to somebody higher up the ladder. And believe it or not, often those people higher up on the ladder form their corporate vibes based upon the literature handed to them.

So here is some professional advice, free of charge.

1) If you don't have a creative, innovative advertising agency, get one. **Make the agencies** in your area **'work' for your account.** Ask each one to tour your facility, and take the time to explain to them what you do and what your industry consists of. Tell them your marketing objectives, who you want to 'reach' and then ask them to make a presentation to you.

2) If you don't have an advertising budget, **make one.** Don't be shocked when you are asked 'how much will you spend in 1985 on advertising?'. Have that number on the tip of your tongue.

3) If you have an advertising budget, **double it.** Right now. Whatever you thought it should be for 1985, you are low. By a factor of two.

4) Insist that your advertising plan do **triple** duty:

A) Every ad, every layout, every piece of art or every photo created should be capable of being used three places:

1) In **brochures** for hand out,
2) In trade **advertising,**
3) In instruction **pamphlets** and booklets.

Insist that this happens and you will get three times the play for the creative bucks.

B) Every trade ad should be **'changeable'** so it can be worked into a point of sale (wall poster or counter top card) display as well. If the basic, expensive, artwork stays the same but you simply change the 'copy' between trade ads and posters, you get more bang for the buck.

5) If you are going to make any kind of 'video' for use by your dealers or in your booth at the trade show, make it do multiple duty as well:

A) An 8 minute piece created as a dealer selling tool should be scripted and produced so that you can lift virtually intact 30 seconds or 60 seconds for trade TV advertising (i.e. on **Boresight,** for example).

You cannot afford to create TV ads for **Boresight,** even though you know your firm should be there. The cost of creating the ad is far more than the **Boresight** TV 'time' and your agency doesn't want to mess with re-doing something from scratch for a low-commission TV 'buy.' Plan from the start where you can 'lift' 30 or 60 seconds, heading it with an appropriate static opening and tagging it with an appropriate static corporate logo and address. NOW, you can play the TV game for just a few bucks in production costs more than the 8 minute dealer demo will cost you.

B) Similarly, a 30 or 60 second segment from the same 8 minute piece can also be scripted from the beginning to lift more or less intact so you can supply distributors and dealers with a custom video commercial for broadcast TV use. You actually want to supply 22 seconds for a 30 second commercial or 50 for a 60 so the distributor or dealer can 'tag' it as their own commercial for local broadcast. And your agency, **if they are smart enough,** will telll you all of this. It may not be the 'same' 30 that you 'lift' for broadcast use that you 'lift' for **Boresight** use, by the way. Remember, the audience for each is different.

C) Don't tie any video piece to a specific event or date or even period of time. Calendars are a no-no. Anything that makes the commercial or video look 'old' before it has had an opportunity to return to you full value is foolish. You can update 'audio' for pennies; **the video costs big bucks** at the agency level to change.

When you are doing video pieces, remember that there are many user factors to consider. For example, length is important. If the master video is going to be used by dealers to explain the 'TVRO story,' a proper length is between 7 and 10 minutes with 10 permissible only if there is extensive use of up-beat music. People have a limited attention span and your emphasis should be on the key user-selling points and **NOT** the technology **nor the hardware.** People want satellite TV because of what it does for them, **not because** of how it does it.

Don't dwell on any aspect of the topic more than 30 seconds.

Repetition turns off people. This is an **'instant gratification society'** and people have several decades of network created video filed away in their memory cells. If you will recall that dramatic video of Lee Harvey Oswald being shot in Dallas more than two decades ago, it only lasted 4.5 seconds. And that is almost exactly how long most people's attention span is with the tube lighting up their eyeballs. It is far more important to **change** the video than it is the audio, but any audio subject going over 25 seconds borders on losing the viewer. Voice only, no music, no tempo, is dangerous and should be used only for emphasis ("Fade music down, cue announcer for one liner, bring music back up . . .").

If all of this is frightening, but you know it is necessary as your own business advances in 1985, give me a call and I'll be happy to discuss some of these techniques with you; or, shuck you off to somebody who is an expert in this area for some free advice.

Remember, Las Vegas will be the most professional show to date. Prepare yourself now for what is coming and you will reap the best harvest possible.

THE WORM Turns

There appears to be a carefully directed effort underway, by the cable TV people, to discredit home TVROs in the marketplace. The adoption of our legislation this past fall has placed the cable folks 'on notice' that sooner or later they will cross swords with us in the marketplace.

Cable seems to have drawn "its sword early" and is going for first blood.

Advertisements have been appearing in southwest and midwestern newspapers which are clearly designed to 'confuse' the marketplace and 'discredit the TVRO dealer.' **An example appears here.** There are dozens of individual reports of such advertisements, widely spread geographically. Most of the advertisements either 'look alike' or 'look similar' and the wording is identical or similar. The advertisements appear either without any 'sponsor indentification' or they appear with the name of the local cable company.

The advertising copy is filled with errors. They claim HBO and Cinemax will be scrambled March 1st (we'll see, but that is highly unlikely as **CSD** readers are aware). They also claim that ESPN and MTV and CNN will be scrambled.

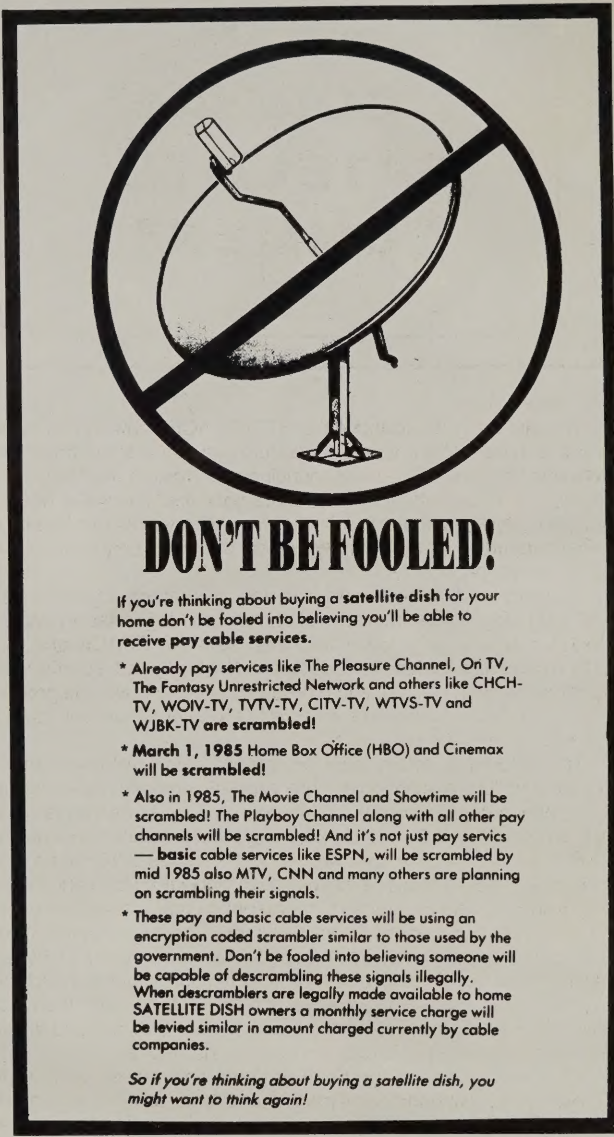
At the same time the advertisements began to appear, newspaper editorial space also started to focus on TVRO ownership and use. One story, appearing in the **Times and Democrat** (Orangeburg, SC) for December 30th stated "People in areas where there's no cable franchise will not have to pay for the services until the channels scramble their signals. **But dish owners in areas where there are cable franchises will have to sign up with their nearest cable company and begin to pay reception fees beginning December 29th. . .**" the story stated.

The battle, cable's battle with home TVRO, is just starting. This is unfortunately but the tip of an iceberg and as an industry we will have no choice but to deal with this issue (again and again) during 1985. There is one 'tool' which the TVRO dealer should have at his disposal for this battle; a copy of the special SPACE videotape prepared late in October featuring **Congressman Charles Rose** (NC) and others commenting on the true nature of the **'Satellite Viewing Rights Act'** of 1984. In this videotape piece, Rose states clearly what the law says and what it means to home TVRO ownership. You, as a dealer, need that tape in your shop to show to those 'writers' from the local press who want 'authoritative statements' for publication, **and** to doubting-Thomas prospective buyers of home systems. This tape is available from SPACE (703/549-6990).

MORE/ The Year Ahead

Drake has recently opened a new 47,000 square foot addition to their facility, planning to add perhaps 250 local people to their present payroll of some 550. **Drake is optimistic about 1985.**

Drake has been the number one brand-seller of TVRO receivers from almost the day they entered our field in 1982. The best studies done indicate their market 'share' either side of 22%, or almost 1 in 4 or 5 units sold. Since Drake knows how many **they** sell, that ought to at least give **them** something to calculate how big the market overall really is.



DON'T BE FOOLED!

If you're thinking about buying a **satellite dish** for your home don't be fooled into believing you'll be able to receive **pay cable services.**

- * Already pay services like The Pleasure Channel, Ori TV, The Fantasy Unrestricted Network and others like CHCH-TV, WOIV-TV, TVTV-TV, CITV-TV, WTVS-TV and WJBK-TV **are scrambled!**
- * **March 1, 1985** Home Box Office (HBO) and Cinemax will be **scrambled!**
- * Also in 1985, The Movie Channel and Showtime will be scrambled! The Playboy Channel along with all other pay channels will be scrambled! And it's not just pay servics — **basic** cable services like ESPN, will be scrambled by mid 1985 also MTV, CNN and many others are planning on scrambling their signals.
- * These pay and basic cable services will be using an encryption coded scrambler similar to those used by the government. Don't be fooled into believing someone will be capable of descrambling these signals illegally. When descramblers are legally made available to home SATELLITE DISH owners a monthly service charge will be levied similar in amount charged currently by cable companies.

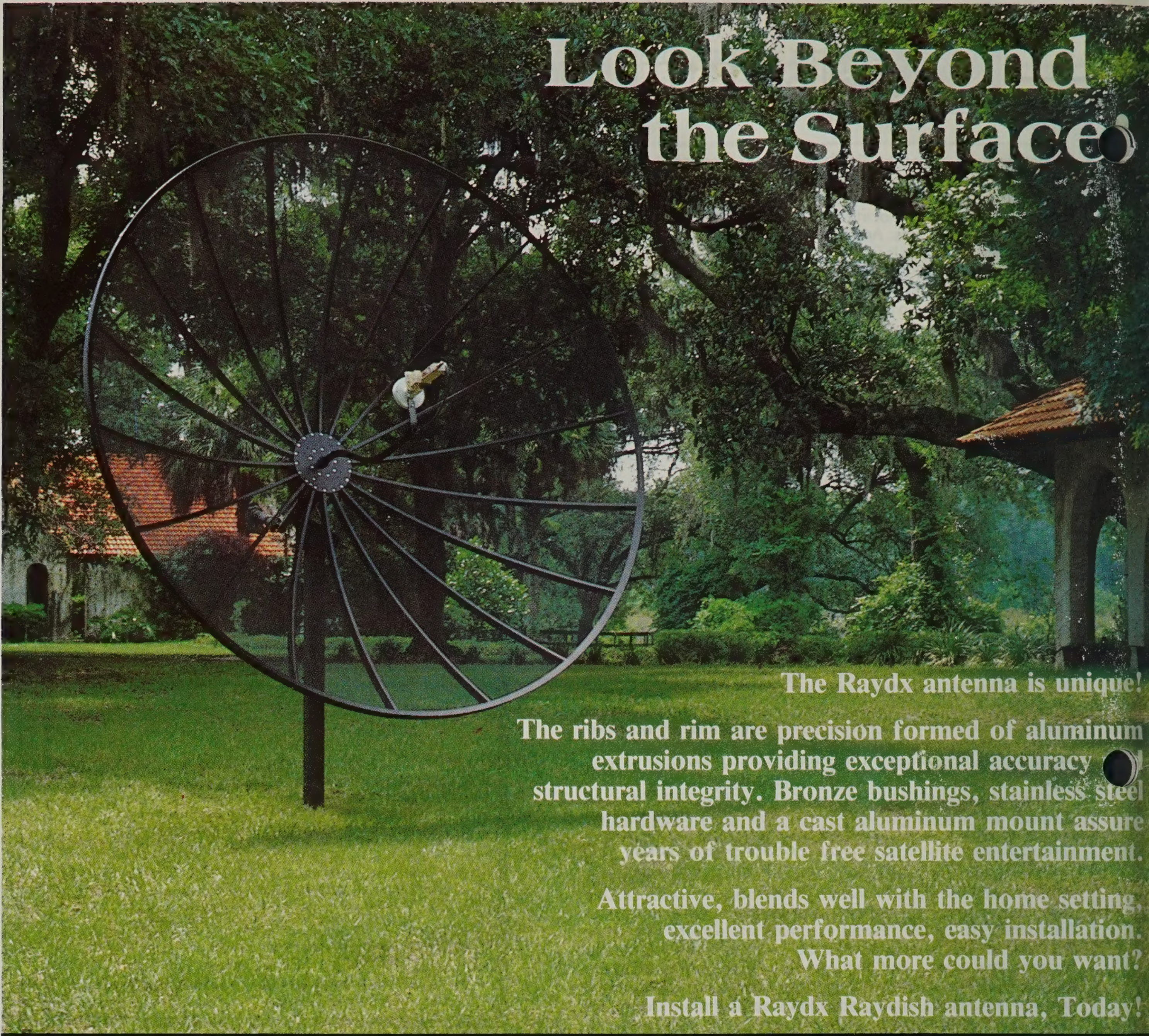
So if you're thinking about buying a satellite dish, you might want to think again!

AMARILLO Globe News published this 'advertisement' in December.

But Drake has been losing ground of late to upstart Uniden and as we reported in our January 15th **CSD/2,** there are many who believe that by the end of 1985, Uniden will have replaced Drake as the number one seller in TVRO hardware. Should you sell your stock in Drake, if you own any? Not unless your name is Peter Drake.

First of all, as **CSD/2** reports, the 'mood' of the industry is not the bottom line; only December 31st will tell us whether Uniden's aggressive selling posture ate far enough into the Drake support base to make Drake play second fiddle to the Far East. I've talked with **Peter Drake** about the Far East and he believes his firm can stand toe-to-toe with the best of the Orient and come out ahead. There is a conscious effort at Drake to make every possible production equipment innovation available in the world today work for Drake. Unlike the American TV set manufacturers who were faced with Far Eastern competition at a time when American production facilities had simply worn out, the folks at Drake have realized that to be competitive long term they must use as little labor and as much automation as their worthy Far Eastern challengers. In fact, you almost **have to adopt** leading-edge OEM technology since the Japanese routinely use automation **and** cheap Taiwan and Hong Kong labor in combination. It's hard to hire a worker

COOP/ continues on page 67



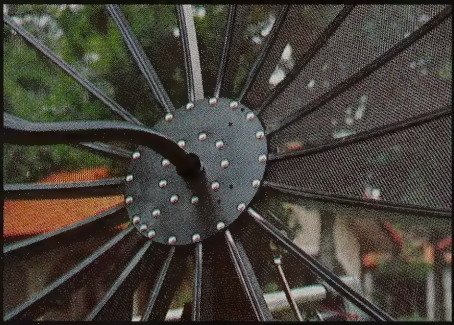
Look Beyond the Surface

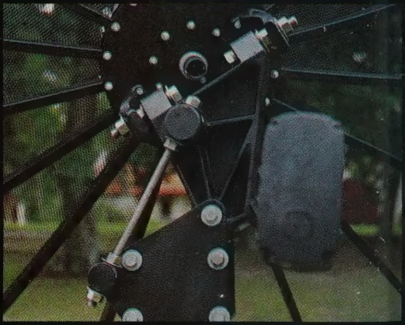
The Raydx antenna is unique!

The ribs and rim are precision formed of aluminum extrusions providing exceptional accuracy and structural integrity. Bronze bushings, stainless steel hardware and a cast aluminum mount assure years of trouble free satellite entertainment.

Attractive, blends well with the home setting, excellent performance, easy installation. What more could you want?

Install a Raydx Raydish antenna, Today!





"We pay attention to Quality"

RAYDX

SATELLITE SYSTEMS, LTD.

9 Oak Drive • Silver Springs Shores Industrial Park
P.O. Box 4078 • Ocala, Florida 32678-4078 • (904) 687-2003

PATENT PENDING

©1984, RAYDX SATELLITE SYSTEMS, LTD

...And See Everything Clearly.

Unique Because Of Its...

- Clean, Uncluttered Appearance
- 10½ Foot Diameter
- High Gain & Low Side Lobe Levels
- Cast Aluminum Polar Mount
- All Aluminum & Stainless Steel Construction
- No Sharp Edges
- U.P.S. Shippability in 2 Boxes
- Fast & Easy Assembly
- Heat Treated Aluminum Ribs & Rim for Stronger Than Steel Strength
- Grooves To Hold Mesh Securely
- Available in Colors
- Double Curvature Mesh
- Accuracy
- Deep .3 f/d Ratio Dish

DON'T BE CONFUSED BY LOOK ALIKES. INSIST ON THE ORIGINAL

Raydx antennas may be obtained from: **Arizona:** Westek Distributing/Digital Satellite, 2401 W. Behrend, Suite 11, Phoenix, AZ, 85027, 602-582-5955, National Watts: 1-800-821-1989 Ext. 319; **Arkansas:** Digital Satellite, 7123 Interstate 30, Suite 14, Little Rock Corp. Center, Little Rock, AR, 72209, 501-565-8443; International Video Communications Corp., 4005 Landski, North Little Rock, AR, 72118, 501-771-2800, National Watts: 1-800-643-5427; **California:** Digital Satellite, 3190 E. Foothill Blvd., Pasadena, CA, 91107, 213-681-6222; Echosphere West, 5671 Warehouse Way, Sacramento, CA, 95826, 916-381-5084, In CA Watts: 1-800-338-5478, Western Zone Watts: 1-800-338-5477; **Colorado:** Echosphere Corp., 1925 W. Darmouth Avenue, Englewood, CO, 80110, 303-761-4782, Central Zone Watts: 1-800-521-9282, In CO: 1-800-521-9282; National Microtech West, Inc., 510 29 1/2 Road, Grand Junction, CO, 81504, 303-243-4433, 1-800-233-8967, 1-800-321-2417; **Florida:** National Satellite Communications, 10779 Satellite Blvd., Orlando, FL, 32821, Out of FL Watts: 1-800-322-4044, FL: 305-851-4738, FL Watts: 1-800-821-8659; Precision Satellite, Inc., 715 Grove Street, Clearwater, FL, 33515, Watts: 1-800-HOT-DISH, FL 1-813-441-9438; Satellite Concepts of Central Florida, Inc., 1801 N. Florida Avenue, Lakeland, FL, 33801, 813-680-1918; **Idaho:** Recreational Sports & Imports (R.S.I.), 2436 N. Woodruff, Idaho Falls, ID, 83401, 208-523-5721; **Iowa:** Digital Satellite, 1601 N. 4th Street,Fairfield, IA, 52556, 515-472-7062; Spectrum Satellite, 3200 Sunnyside Avenue, Burlington, IA, 52601, 1-319-753-0176, IA Watts: 1-800-533-2644; **Kansas:** Digital Satellite, 2355 S. Edwards, Wichita, KS, 67213, 316-942-3131; **Louisiana:** Satellite Specialists, 414 Columbia Street,Bogalusa, LA, 70427, 504-735-9915; **Michigan:** S.R. Systems, 12286 U.S. Route 27,DeWitt, MI, 48820, 517-669-2465; **New York:** Digital Satellite, 144 High Avenue, Nyack, NY, 10960, 914-353-1606; National Satellite Communications, 21 Century Park, Clifton Park, NY, 12065, 518-383-2211, National Watts: 1-800-833-4485, NY Watts: 1-800-522-3538; **Ohio:** Cartwright Communications, 7812 Red Sky Drive, Cincinatti, OH, 45249, National Watts: 1-800-543-8614, OH Watts: 1-800-582-2641; S.R. Systems, 145 Columbus Road, Athens, OH, 45701, 614-594-2524; **South Carolina:** Fibertron, Inc., 111 Cash Street, Lake City, SC, 29560, 803-394-8197; Quarles Satellite Systems, 1616 Calhoun Road, Greenwood S., SC, 19646, SC Watts: 1-800-922-9704, Out of SC Watts: 1-800-845-6952; **South Dakota:** Warren Supply Co., 300 E. 50th Street N., Sioux Falls, SD, 57104, 605-336-1830, National Watts: 1-800-492-7736, SD Watts: 1-800-952-3046; **Tennessee:** Echosphere East, 10536 Lexington Drive, Knoxville, TN, 37922, 615-966-4114, Eastern Zone Watts: 1-800-223-1507, In TN Watts: 1-800-421-9935; Lewis Electronics, West Elm Street, Humboldt, TN, 38343, 901-784-2191; **Texas:** Echosphere Southwest, 3901 LaReunion Parkway, Bldg. 15, Dallas, TX, 75212, 214-630-8525, SW Zone Watts: 1-800-521-9282, In State of TX: 1-800-521-9282.

RAYDX T.M.

SATELLITE SYSTEMS, LTD.

SMALL vs 2°/ NO OUCH?

30,0000 'Kinds' Of Fiberglass?

People who rattle cages and shake trees are often viewed with a combination of skepticism and disdain. 'Who are they' one asks 'to come in here and tell me everything I am doing is wrong!'.

Paul Gagliano of Southern Star Satellite Antennas**(*)** does not appear at first blush to be a cage rattler. He is quiet, reserved, and mild mannered. He listens more than he talks. But when he talks, you listen. Gagliano is privvy to certain fiberglass technology which may have escaped the general practioneer of the 'fiberglass art' to date and once you get beyond the hurdle of accepting his wisdom and experience you listen carefully.

Gagliano's firm has been making 'high tech' fiberglass parts for a number of years. They do it for competition racing cars, for jet fighter airplanes, and a wide variety of 'close tolerance' industrial users. Gagliano does not like the word 'fiberglass.'

"When people say fiberglass in the TVRO field, they instantly think in terms of fiberglass which one sees in the boat industry. Big, tough stuff built by people who understand the environment of water and sea and salt. This is unfortunate because there are nearly 30,000 different 'blends' available which fall into the generic term 'fiberglass' and only a handful of those blends are suitable for boats. And none of the blends suitable for boats are suitable for satellite antennas." Like we said, he rattles cages.

"If you set up a shop to build 'fiberglass' TVRO antennas, and you buy the same resins and the same continuous roving and same mats as the fellow down the road building boats, you are building odd-shaped boats for sale in TVRO; not TVRO antennas. It is unfortunate that this type of 'fiberglass' technology ever got started in TVRO antennas because boat manufacturers are only interested in bulk and weight and they do not have the same quality or pricing sensitivities that we should have in the TVRO antenna field."

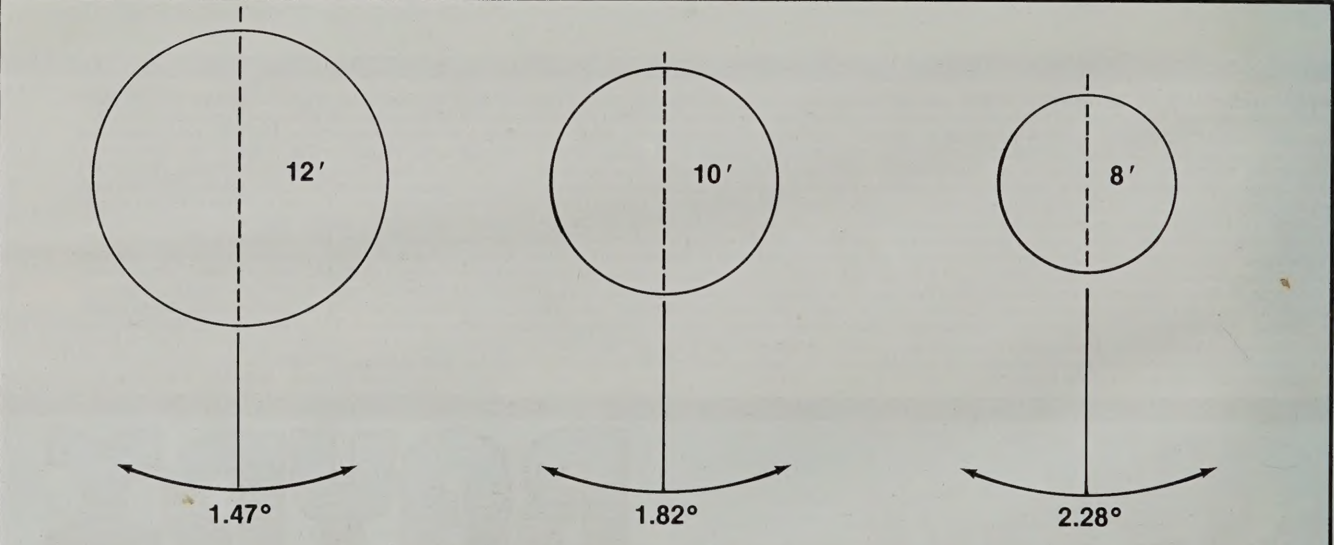
Gagliano does not build 'fiberglass' TVRO antennas like boats. He builds them (presently only a 7 foot 8 inch model) as a distinct product; the distinct product which he believes TVRO antennas are, and should be.

But the Gagliano story is more than simply the creation of a 'fiberglass' TVRO antenna using 'high tech materials'; it is far more than this. Gagliano has systematically studied all of the common TVRO antenna and TVRO receiving problems to determine which of those problems might be improved, or eliminated, by applying better 'engineering' to the product. TI is one of those problems.

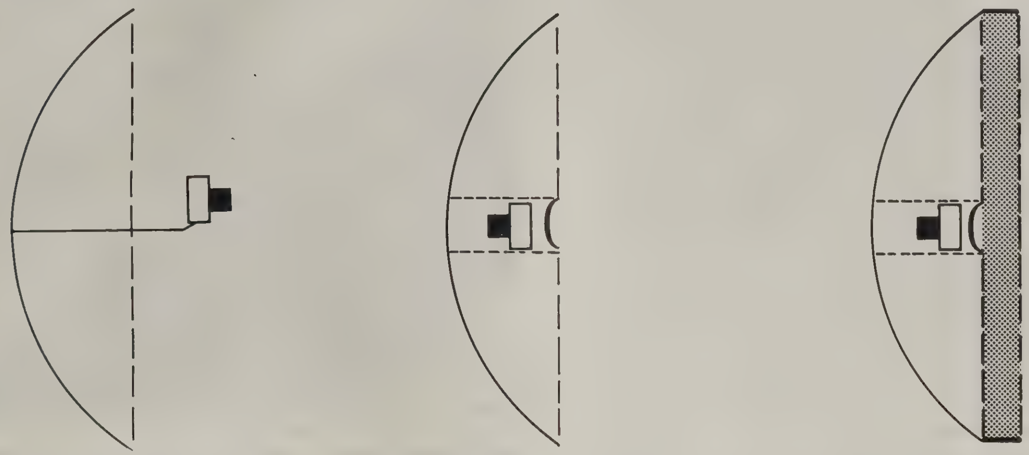
"Any standard antenna textbook will tell you in great detail that if you can reduce the spacing between the feed and the reflector surface, in effect making the dish deeper with a smaller f/D, you can reduce the impact of terrestrial interference. There is no magic about this; as the feed comes closer and closer to the dish proper, the dish acts as a 'shield' for the feed. If you could shove the feed all the way to the surface of the dish, and still get it to work like a dish, you would have virtually complete shielding for the feed from the dish proper. We have elected to place the feed as close to the dish as possible, to obtain maximum dish shielding of the feed. We have done this at an f/D of 0.25 and to make this work we have adopted the cassegrain feed approach."

Ooops. Shades of the Harris Delta-Gain!

The SSSA just-under-8 foot dish breaks several 'rules' of



DISH BEAMWIDTH IS A FUNCTION OF DISH SIZE; LARGER APERTURES HAVE NARROWER BEAMWIDTHS. SIX FOOT IS 3.02° AND FOUR FOOT IS 4.56°.



PRIME FOCUS FEED
WITH LARGE(R) f/D PLACES ANTENNA FEED IN 'UNPROTECTED' ENVIRONMENT, IN FRONT OF DISH

CASSEGRAIN FEED
WITH SMALL f/D PLACES ANTENNA FEED IN 'SEMI-PROTECTED' ENVIRONMENT WITH DISH PROVIDING SHIELDING

ADDITIONAL PROTECTION
IS PROVIDED BY EXTRA 'SHROUD' (MICROWAVE FENCE)

classic antenna lore.

1) It uses a cassegrainian feed structure with a **small** reflector surface. That is not supposed to work, because of a combination of shielding caused by the sub-reflector and the limitations of feeds to adapt to such 'wide aperture' vision.

2) It is a very light-weight dish (120 pounds with mount and electronics, well under 100 pounds for the one-piece reflector alone) using 'fiberglass' materials that you don't instantly recognize from **our** antenna world.

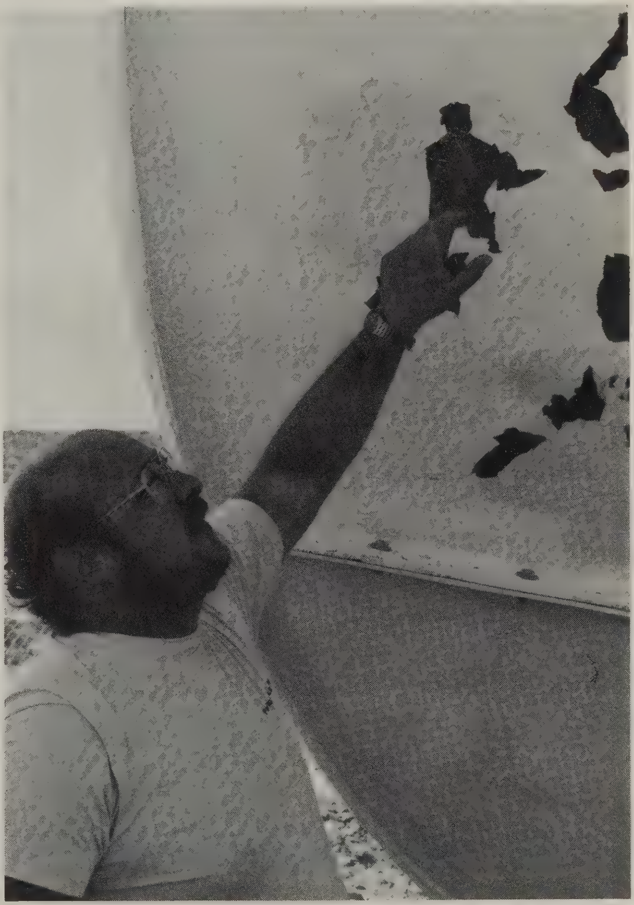
3) It uses a 'tuned feed' (originally from the Chaparral family, but SSSA Modified) and a 'tuned sub-reflector' which Gagliano claims and tests substantiate 'steers' the first antenna sidelobe null away from 2 degree spaced satellites (more about this shortly).

4) Then it offers an optional 'microwave fence' or (6") shroud which circumferences the outer rim of the dish to provide enhanced shielding for the closely spaced sub-reflector and feed.

Gagliano is quick to point out that he and his firm have 'invented nothing new,' but that they have merely gone back to the **original antenna texts** and created an antenna 'system' which picks up the best of several related technologies to create an 'urban-style' dish system.

URBAN Problems

As the TVRO industry marches away from the farmlands and closer and closer to big-city America, it is concentrating sizeable amounts of its energy on the urban areas of America in 1985. There are at least two practical TVRO problems in urban America; neighborhood resistance (legal or moral) to TVRO antennas on postage-stamp sized lots, and, terrestrial interference (TI). Downsizing of TVRO antennas (under 8 feet in the case of the SSSA-7.8) is a step in the right direction for zoning or neighborhood relations. Designing the full dish as a



PAUL GAGLIANO/ the man behind the SSSA-7.8 antenna on the Provo Test Lab site.

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*/ **Southern Star Satellite Antennas,** Paul Gagliano, 269 19th Street North, St. Petersburg, Florida 33705; 813/821-6881; price is $500 dealer net and $100 for microwave fence.

/ **Promar, Inc., 4912 W. LaSalle Street, Tampa, Fl. 33607; 813/876-7677. Promar is presently the exclusive distributor for the SSSA-7.8 antenna.

'system,' with the optional TI 'microwave fence' is an excellent start on the interference problem.

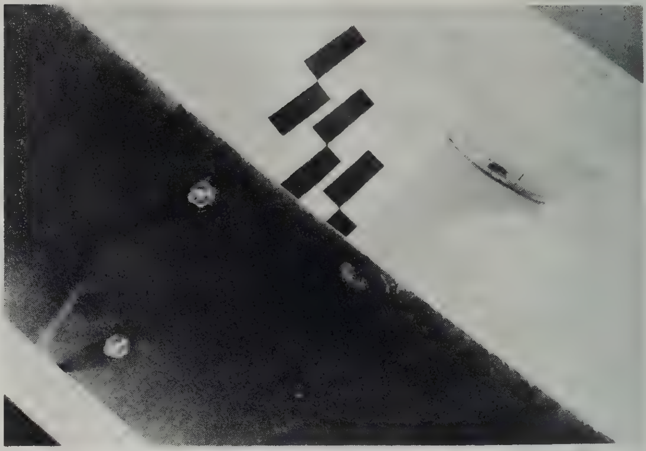
SSSA distributor **Bill Miller** of Promar, Inc. **(**)** was one of the first to discover just how effective the 7.8 could be in curtailing (if not totally eliminating) the TI problem. Miller has been distributing 12 foot Paraclipse antennas along Florida's west coast for several years. He has done well with the antenna and it has done well by him. But the prime focus feed on the Paraclipse 12 sits out there far in front of the dish where any TI signals in the area can be exposed to the feed surface. Once on the surface, they can only be eliminated with in-line receiver filtering.

Miller reports **"I was convinced first of all that we could** not **live with anything less than a full 12 foot surface on Florida's west coast;** footprints are not THAT good here. However, we were finding that a sizeable percentage of our dealer's business was being shut-off because of TI. Getting a strong signal became secondary to getting ANY signal. So we tried the SSSA 7.8 mostly out of curiosity. Yes, the pictures were weaker than with the 12 foot. But now we had pictures rather than interference."

Gagliano makes the claim that with the SSSA-7.8 plus the optional microwave fence, he is able to cure every fifth TI situation totally without in-line receiver filters; a 20% success rate.

"If the TI source is from the rear, or sides, whether direct or from reflections, the microwave fence coupled to the deep dish design really works. When the source comes at the feed from the front, the shroud makes no real difference. We have found that many TI sources come both direct and 'delayed' from reflections. You can cure some of these but not all of them."

CHECKING for TI/ CSD's Marshall Foiles aligns the Newton 2600 signal generator test set with the 'rim' of the microwave fence.



MICROWAVE FENCE creates a shroud or protective barrier around the dish's feed to reduce TI signal penetration. Gagliano says 20% of TI cases are solved without filters by employing 'fence' **plus deep dish design.**

A higher rate of success (such as 98%) would be a headline. A twenty percent cure rate is encouraging but not earth shaking. Still, it has been an important 20% to many of the west coast Florida dealers who have found they can sell a system with the SSSA-7.8 but not with any other antenna.

So what about the weaker signal part?

Gagliano has had his antenna range tested. He reports on the numbers achieved.

"The gain is 39 dB at 3.7 GHz (TR1) **and 40 dB at 4.2 GHz** (TR24). That translates to 76% efficiency." Some will raise their eyebrows at the efficiency percentage. However:

1) The text books will tell you that it **is possible** to achieve additional gain (or efficiency) with a cassegrain design antenna over a prime focus antenna. But the same text books 'warn you' that some of this additional 'theoretical gain' can be (and usually will be) 'lost' if the antenna feed is not done properly.

2) The same text books suggest that it is possible to 'shape' or more importantly 'steer' the antenna pattern with a 'cassy' sub-reflector.

Small antennas have wider or broader main lobes than larger antennas. A **diagram here** illustrates the increase in mainlobe width as the antenna aperture reduces from 12 feet to 8 feet (or smaller). This is where the 'adjacent satellite problem' comes in.

At the present time the FCC allows or assigns orbital spacings of from 2.5 degrees to 4 degrees between satellites operating at 4 GHz. Down the road, before the end of the current decade, the FCC tells us that all 4 GHz birds will be uniformly spaced at 2 degrees; closer than any pair of video-operational birds at the present time.

If you leave everything alone and start off with an 8 foot diameter reflector, and install a prime focus feed, you should have a (3 dB) **beamwidth** of **2.28 degrees.** That means that if your dish is pointed at 99 west exactly, the dish will still be receiving signals from 97.86 and 100.14 degrees at a level that is but 3 dB weaker than the bird at 99 west. Or, if the birds were located at 97, 99 and 101, the signal from a bird at 97 and at 101 would be only 8 dB or so weaker than the bird at 99. Since we know from extensive testing that a signal 12 dB weaker still produces 'objectionable interference' and that an unwanted bird must be 18 dB weaker (or down) to produce **no objectional** or noticeable interference, it is obvious from these elementary numbers that a prime focus fed 8 foot antenna would be in deep trouble with 2 degree spacing.

Gagliano's cassy sub-reflector 'steers' the feed's sidelobe pattern and **forces a null** to be at 2.1 degrees either side of center. That null, according to SSSA provided range test data, is 20 dB 'down.' And that says that birds, in our example at 97 and 101 degrees, would be down by 18 dB or more. Has Gagliano **'solved'** the 2 degree/small dish problem?

Not quite. For it is axiomatic that when you steer a pattern, by clever sub-reflector design in the case of the cassy SSSA-7.8, the null you created at 2.1 degrees left and right has to pop up as a 'peak' someplace else. In the case of the present SSSA-7.8 antennas, that secondary peak occurs very close to 4 degrees either side of center. And **that peak** is but 12 dB or so below the main lobe.

And 12 dB is not enough to solve the problem. And 4 degrees is, unfortunately, simply 2 degrees X 2. So in the present generation of SSSA-7.8 you certainly do eliminate the potential interference from birds **immediately adjacent** (plus and minus 2 degrees of boresight), but in the process you pick up the birds two steps removed (plus and minus **4 degrees** of boresight). Have you really solved anything?

Gagliano thinks you have.

"Our concern, now, is as a regional antenna supplier along Florida's western coast. With the signal levels we have here, as weak as they are, a bird 10 dB or so down, 4 degrees removed, is not a problem." He admits that further north, in the Florida panhandle for example, he has seen 4 degree separated interference (weak, but detectable) while looking at F4 (76 west), from F2R (72 west).

What about the weaker signals? While the 39 to 40 dB gain number is certainly 'state-of-the-art' for an under 8 foot antenna, they are not a substitute for 42 dB or so with a quality 11 to 12 footer.

Gagliano and Promar's Bill Miller brought one of the SSSA-7.8 antennas to the Provo CSD Lab test range in December **(***).** With Miller came a newly released **California Amplifier 55 degree LNA.** Cal Amp has been working on some 'ultra-low-noise' packages for about a year now and they have a pair in the 55 degree range which they hope to begin shipping shortly. The 55 degree we received was 'advanced production,' meaning it came down for test purposes but was not available in sufficient quantities in December to warrant a full scale announcement to the trade. A later version, to be tested in the spring, will also be 55 but it will have a front-end isolator whereas the unit we received from Miller was 'isolator-less.'

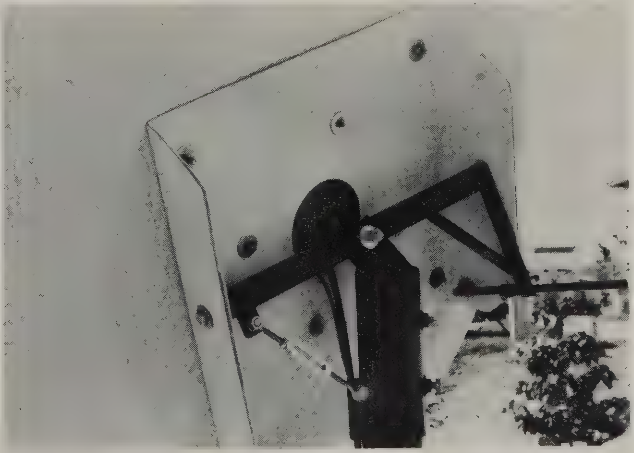
So, what would we find with an ultra-low-noise LNA (or LLNA)? Could one see, and measure, the difference between 55 degrees and 85 degrees (we started off with a Drake 85 degree unit)?

First these caveats. Any LNA, **without an isolator,** runs some risk of being 'detuned' or 'loaded down' by the feed. If the detuning is severe enough, the LNA's carefully created (and measured) noise temperature will be degraded. It is certainly possible for a 55 degree unit to detune into an 85 degree unit, for example.

SUB-REFLECTOR feed for the SSSA-7.8 is well shielded from TI sources by the rim of the dish proper. Modified Chaparral feed, LNA and downconverter can be housed inside of the feed (accessible from rear).

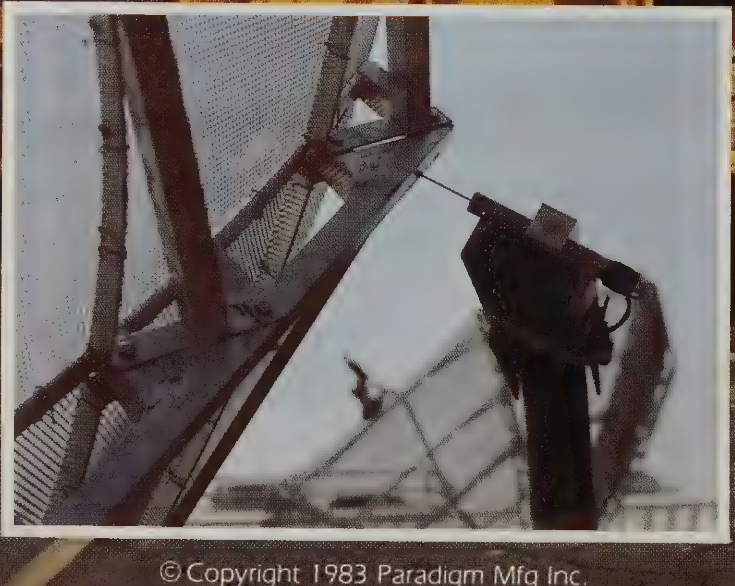
Gagliano had explored this possibility in Florida, and he had his antenna plus feed carefully calibrated for 'match.' He says the VSWR (standing wave ratio or match) with his cassy sub-reflector is 1.25 to 1 with a fixed feed (i.e. single polarization feed with special mouth modificaton for the closely spaced cassy sub-reflector) or 1.32 to 1 with a (modified) Polarotor feed. An absolutely perfect match would be 1.00 to 1(.00) but those don't happen even on a test bench. 1.32 or 1.25 to 1 is in the very good range, equivalent to a power loss in the 1.3 to 1.9% region. In terms of an antenna with 40 dB of gain, the power being lost due to mis-match is therefore in the vicinity of .7 of a dB. But the loss, slight as it seems to be, is less important here than the impact the VSWR (match) might have on the LLNA. Remember, **without an isolator,** those standing waves or mis-match are carried directly into the first GaAs-FET amplifier stage of the LNA. And **they** are your potential problem with detuning of the LLNA.

To measure the change in performance between the



REAR of SSSA-7.8 carries several Gagliano 'secrets' **including a steel plate inside the center portion which provides structural strength to the light-weight appearing construction.**

***/ **On Boresight TVRO Magazine,** TR16, F4 at 9 PM eastern Thursday each week, a four part series built around installation and testing of the SSSA-7.8 antenna, and testing of the 55 versus 85 degree LNAs is running currently. The series began January 31st and ends on February 21st.



HURRICANE

Your new antenna is all set up, adjusted, fine tuned and the service technician is on his way back to the shop. Now the real test begins. Will it continue to perform? For how long will it maintain the picture quality it has today?

Your antenna will have to face the wind and weather every hour of every day of its life. This will be its toughest test. To survive, you'll need equipment strong enough to take whatever nature can throw at it. You'll need Paraclipse.

It is impossible to gather conclusive data about the effects of storm generated stress on an antenna unless you can control the storm. We wanted to put our equipment through an intense, concentrated weather test to measure its

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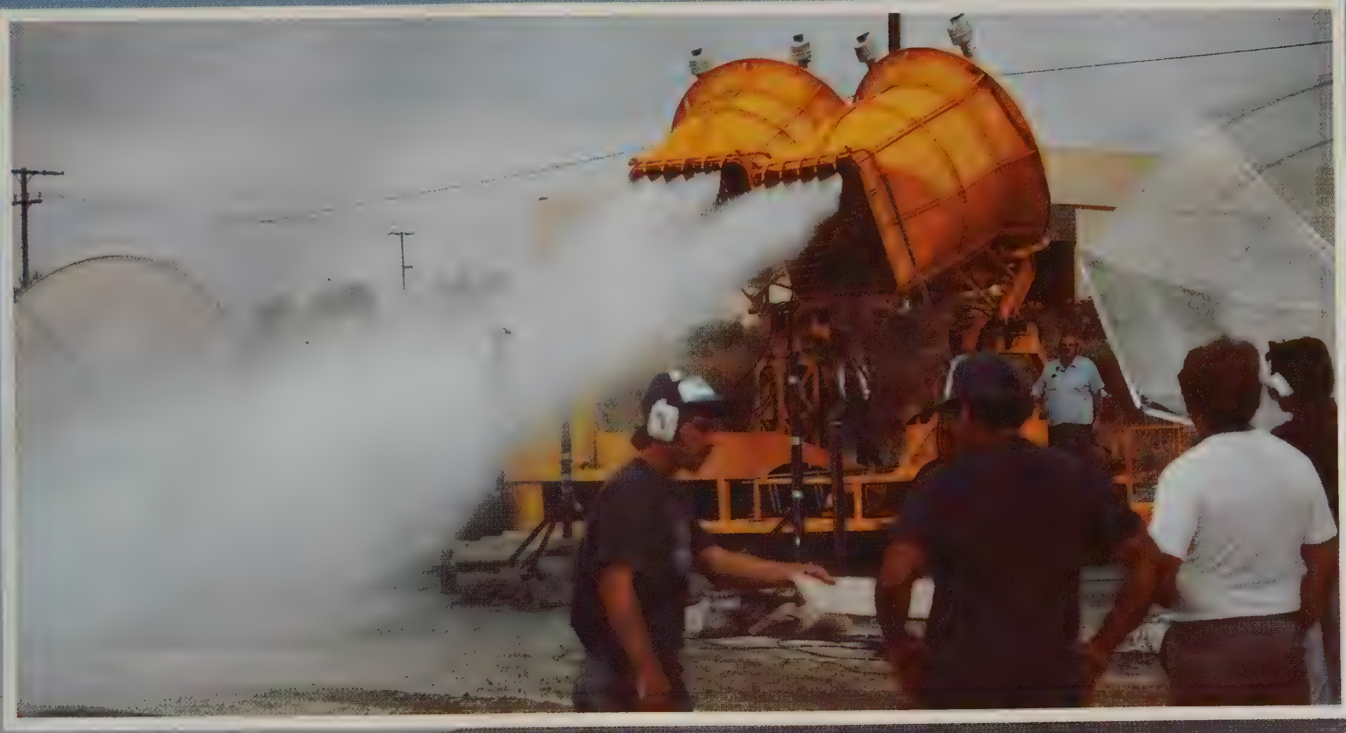


PIONEER MEMBER OF SPACE

Paraclipse

HIGH PERFORMANCE SATELLITE TELEVISION SYSTEM

performance, so we hired a "professional hurricane" to see if we could break a Paraclipse.

We dumped 337 gallons of water per minute into a 95 mph windstream to create the wind load equivalent of a 140 mph storm. Each antenna was tested at five different elevation settings and was blasted from eight different angles.

After several hours of abuse, both Paraclipse antennas emerged undamaged and in perfect shape. Off-air satellite signal evaluation at the end of the tests, indicated the Paraclipse antennas maintained the same electrical parameters as prior to the tests. After testing, measurements show no warping or distortion of the welded aluminum truss structure or mount assembly. Both antennas, in spite of loads to which they were subjected, maintained parabolic symmetry and accuracy. Neither antenna suffered any damage; not one piece of mesh was bent or one clip lost. Both antennas were absolutely stock items assembled according to standard instructions.

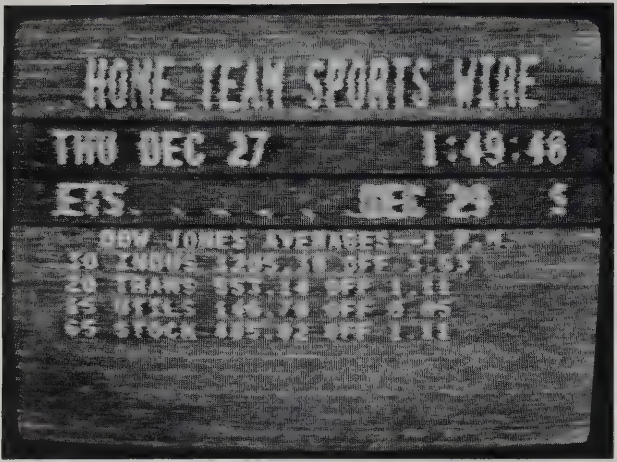
The welded aluminum Rib & Ring Truss System pioneered by Paraclipse is still the lightest, strongest, most accurate design available. The concentric ring trusses, to which the heavy expanded aluminum mesh is fastened, form a perfect compound parabolic shape that even a hurricane can't bend. The all steel polar mount and base are powder coated to further seal and protect them from the elements.

A Paraclipse system has the structural strength and dimensional stability to maintain the integrity of its parabolic shape under the worst of conditions. Paraclipse materials are chosen for their lightweight strength and corrosion resistant properties. Every aspect of the Paraclipse design represents strength in performance.

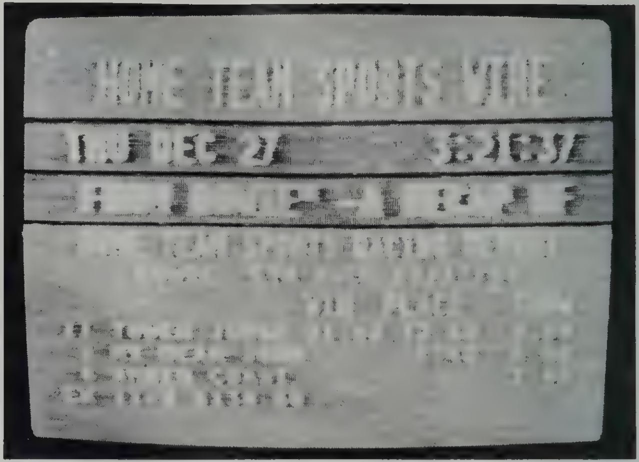
Paraclipse, strong, lightweight, weatherproof, shippable, easily assembled with simple hand tools, an affordable quality antenna from a very reputable manufacturer.

Dollar for dollar, you just can't buy more performance.

Paradigm Manufacturing, Inc.
3711 Meadowview Drive
Redding, California 96002
(916) 244-9300 (916) 365-9131



85° DRAKE LNA



55° CAL-AMP LNA

Drake 85 degree and the California Amplifier 55 degree, we recorded the video from both using the transponder 12 service on Galaxy 1. **There is noise in this service** (i.e. below threshold) on the SSSA-7.8 dish, in the Turks and Caicos Islands. That's good; **we want to be below threshold** because we are better able to measure signal level changes when we are threshold-minus than threshold-plus.

(The actual tests will be seen on **Boresight Magazine** February 21st; F4, TR16, 9 PM eastern.)

Some still frame photos here do a reasonable job of showing you what to expect in the way of performance changes with a 55 to 85 comparison swap out. The 85 degree was measured as 0.9 to 1.1 dB **poorer** in carrier to noise ratio than the 55 degree California Amplifier LNA. Summary? The California Amplifier 55 degree LLNA did what it was supposed to do, and what one might hope it would do; it partially corrected for the antenna down-sizing by picking back up some of the signal margin lost.

TI Tests

We have many unusual things in the Turks and Caicos Islands; terrestrial interference is not one of them. So we set out to create our own.

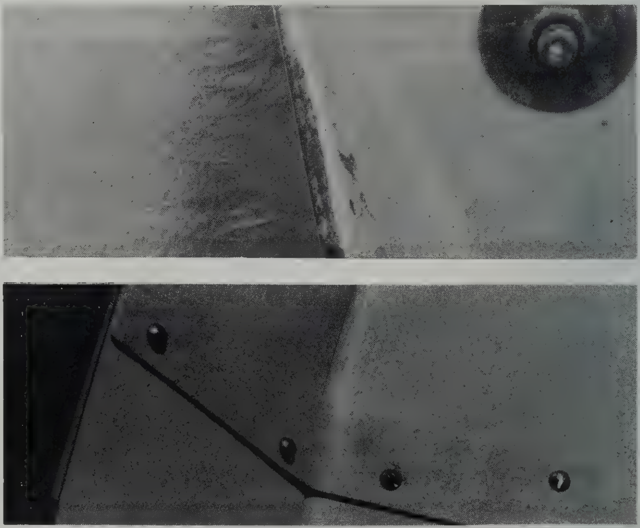
Using the Newton Electronics model 2600 test set (see feature report on page **15** here) Marshall Foiles deliberately set out to determine just how much signal, and from which direction, would be required to destroy the marginal reception from the G1 signal source. What we found is this:

1. The dish itself is capable of between 42 and 50 dB of rejection of signals coming at the dish from the rear or side-rear. This is about the same type of number we 'measure' when attempting the same measurements through a solid metal dish (such as an ADM).
2. If the 2600 Souper Antenna feed is set up on a stand and a section of the SSSA-7.8 microwave fence is removed from the dish, thereby making the dish 'open' to the interference source (Souper feed), **directly from the side,** the apparent rejection ability of the microwave fence appears to be in the 40 dB region as well. This happens to be logical, by the way, since the material used in the SSSA 'microwave fence' is identical to the material used in the dish proper.

Far more extensive testing is indicated. One of the advantages to creating your own microwave interference is that you can control the transmission as well as the reception parameters. In the field, you are dealing with unknowns on the transmission end. We suggest that those doing extensive TI testing investigate the technique shown here since it offers repeatable test results with a controlled environment.

Gagliano's experience is growing by the day and the week. He admits to being slow and methodical and from our three day visit with him at the **CSD Test Lab,** we would have to agree that his efforts are precise and straightforward. How his type of thinking (lighter weight dishes using 'high tech' materials, steerable cassy sub-reflectors, microwave fence shrouding) may impact on an industry already overburdened with 'solutions' to a growing litany of reception problems remains to be seen.

Still, there is the hope and at least our test verification that something significant may be happening here in both antenna design and by the happy coincidence of LNA technology, in lower noise reception. Firms such as Southern Star Satellite Antennas and California Amplifier are to be applauded, and their efforts encouraged for from firms willing to venture into unknown regions such as this comes our ever broadening and ever more mature technology base.



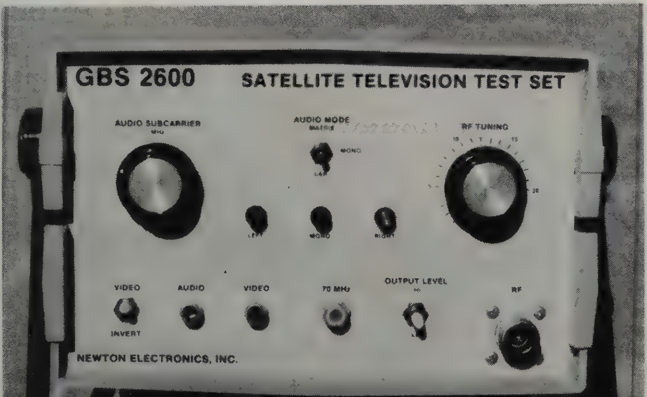
FINISH is not surfaced but actually 'imbedded' into the fiberglass materials so that long term there is no gel-coat separation or surface blemishing.

USING SIGNAL SOURCES FOR SYSTEM TESTS

TEST The Tester

The very first 'home brew' satellite terminals placed into service back in 1978 and 1979 were often configured around 'surplus' or used commercial equipment. And usually in the hodge-podge of equipment the terminal builder assembled, he found a 'signal generator' which tuned through the 3.7 to 4.2 GHz band. The signal generator was a very useful tool because you could point a small test antenna, connected to the signal generator, in the general direction of your TVRO antenna and feed and then 'tune-up' your home brew feed, your home brew LNA and your home brew receiver. Mercifully, those days are now past but the need for a signal generator has not passed.

Newton Electronics, Inc. is one of those Taylor Howard-involved firms hugging the perimeter of San Francisco Bay, in Mountain View, California. Newton started out building bits and pieces for TVRO; IF strings, PLL packages and other piece-parts which ended up being used by some of the early TVRO receiver builders for their complete receiver assembly. More recently Newton entered the 'TVRO test system' market and created a test signal generator which many (mis-)figure is only within the financial reach of OEMs and other large volume users.



2600 controls are panel-spread but grouped by function.

MORE THAN enough power to shoot through this 16 foot Paraclipse dish and into the feed. You can 'hit' **the system from virtually any angle although of course being in line with the satellite** (and beamwidth of the antenna) **would produce maximum range and sensitivity.**

The **Model GBS 2600 Satellite Signal Simulator** does exactly what the latter part of its name suggests; it generates or creates a signal which 'simulates' a satellite signal. This is no advanced technology trick as a brief look at an accompanying diagram will reveal. The object is to create a signal which can be 'coupled' to a TVRO antenna, and by using the test signal you can verify the performance of all of the parts of a TVRO system. Years ago people had sufficient difficulty even finding a satellite with their antennas that it was deemed important to be able to verify that your system worked before you spent two hours or two days trying to locate the first satellite signal. With more satellites, and stronger satellites, even the novice can find one of the pesky creatures in 30 minutes or less time so the need for a device to verify that the entire system is functioning is less apparent today than in say 1982. Still, there is a need here.

The GBS 2600 'simulator' proved to be a fairly burdensome system for Newton to manufacture, and it was felt that it may have been over the budget of the dollar conscious **dealer.** The first (and only volume) users of the 2600 were receiver OEMs who quickly discovered that with this unit you could do TVRO receiver alignment without ever seeing a satellite. And in fact Newton 2600 units grace many of the off-shore production houses where they provide the **only** 4 GHz signals for receiver and downconverter alignment and test.

Late this past fall, Newton introduced a baby version of the 2600 calling it the 1600. In the interim, it has become apparent

Introducing the DSB-600:

EVERYTHING YOU'LL EVER WANT IN A HOME RECEIVER.

- Block downconversion
- Capable of multiple-receiver hook-up
- Picture quality comparable to commercial receivers
- Both 4 GHz and 12 GHz compatible
- Video clamp/unclamp switch and composite baseband output
- Frequency stability unmatched by other home receivers
- Compatible with mechanical and electronic polarizers as well as DX's dual-polarity system
- Affordable price

The moment you see the picture you'll see the difference. In fact, from every standpoint—quality, performance, technology, price—the new DSB-600 from DX is a step ahead of other home receivers.

It has the DX quality features you've looked for, but for much less than you'd expect to pay. Developed and engineered by DX Antenna, an international leader in satellite reception systems.

DX
ANTENNA

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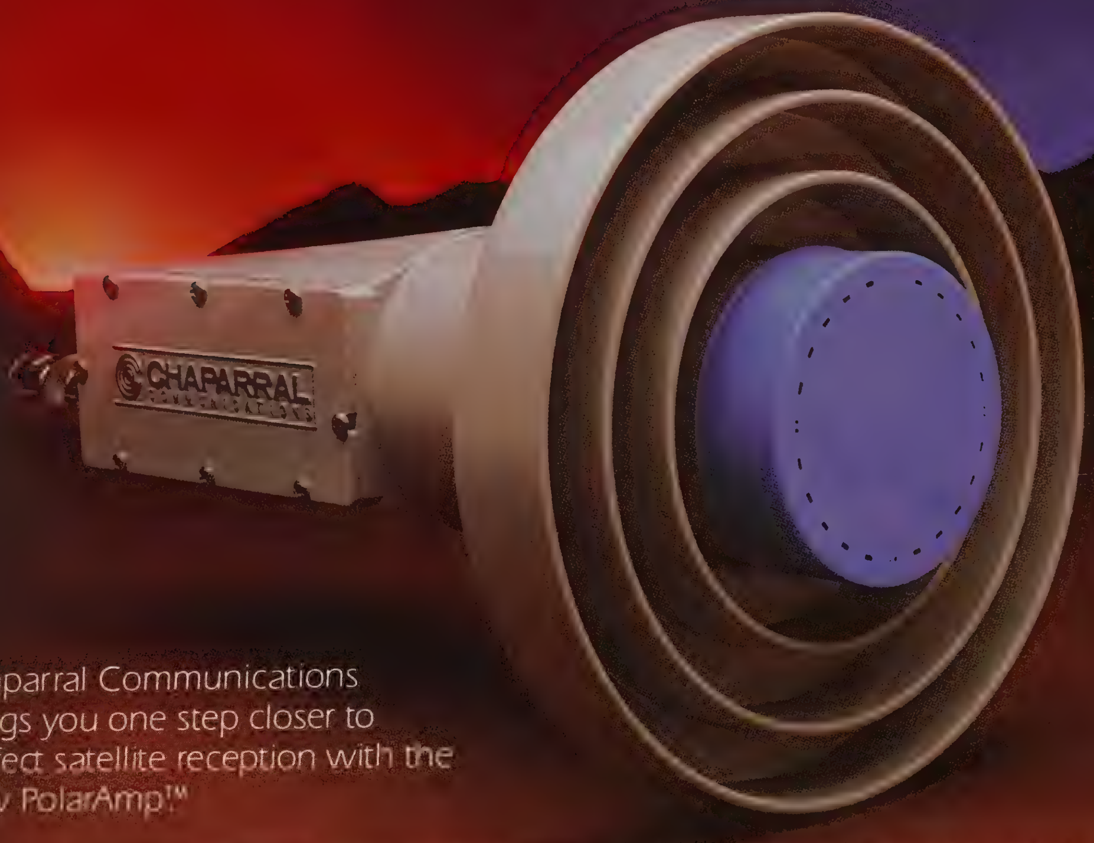
ONE STEP CLOSER



Chaparral Communications brings you one step closer to perfect satellite reception with the new PolarAmp.™

The PolarAmp combines a premium-quality L.N.A. and the reliable Polarotor® in one precision casting. All PolarAmp L.N.F.™ units deliver 50 dB gain at noise temperatures ranging from 100 degrees down to 65 degrees Kelvin.

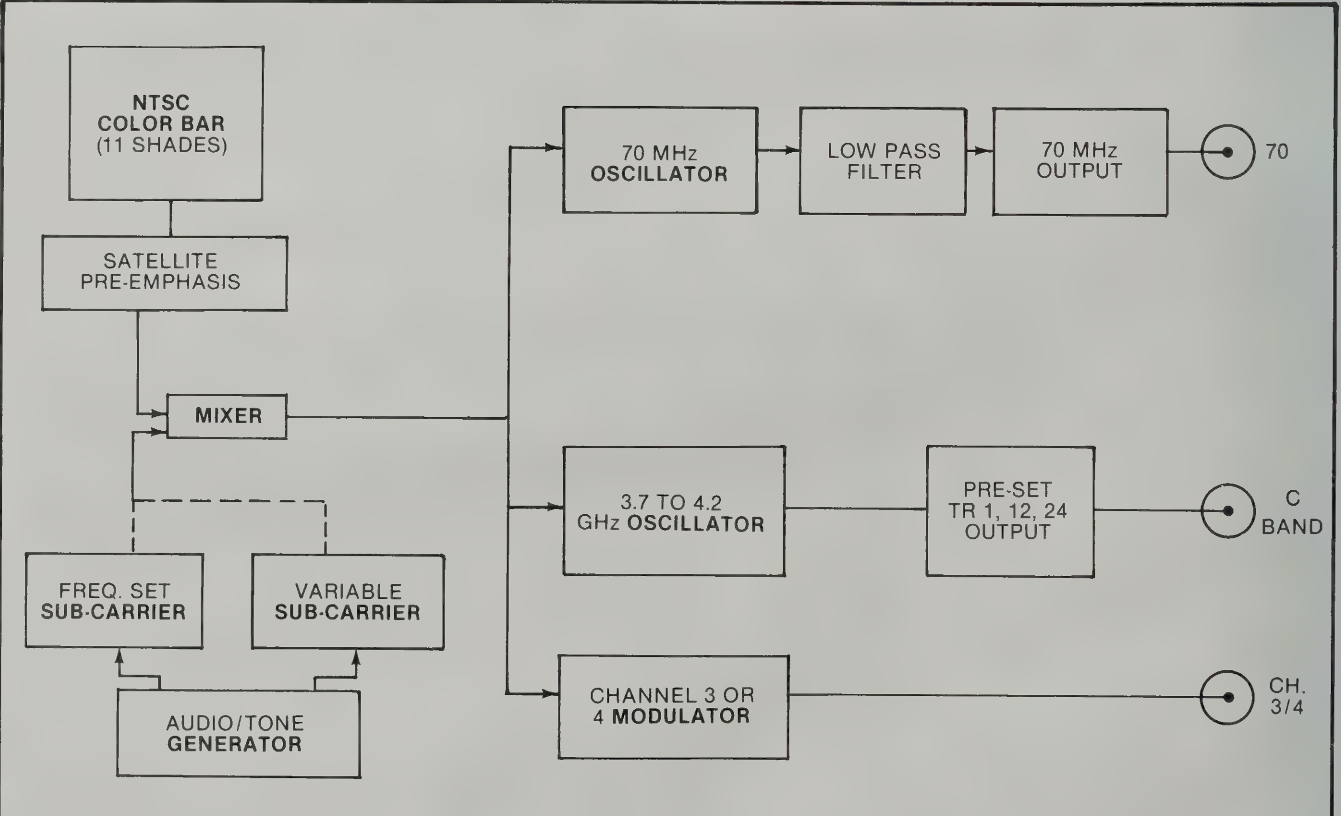
The PolarAmp brings you one step closer through improved performance, simplified installation and greater reliability. Take the first step, contact the Chaparral distributor nearest you and ask about the PolarAmp.™

CHAPARRAL
COMMUNICATIONS
2360 Bering Drive, San Jose, CA 95131

that the more complex 2600 is being phased out and buyers may soon have only the 1600 to select from. Here are the basic differences between the two:

Function/Spec	2600	1600
Output Frequency Range	3.7 to 4.2 GHz, tunable	**TR1, 12, 24 switch selectable**
Output Level	−40 dBm, ±8 dB, or −20 dBm	**−30 dBm, ±8 dB**
Frequency Tolerance	±5 MHz max	±5 MHz max
Transponder Select Accuracy	±10 Mhz center	±10 MHz center
FM Deviation	24 MHz peak to peak	24 MHz peak to peak
Output Frequency Range	70 MHz	70 MHz
Output Level	−40 dBm, ±8 dB, or −20 dBm	**not specified**
Video Modulation	NTSC bar, 11 shades	NTSC bar, 11 shades
Frequency Tolerance	±5 MHz max	**±200 KHz center**
FM Deviation	24 MHz peak to peak	10.75 MHz, peak max
Video Pre-Emphasis	NTSC, RS250-B	NTSC, RS250-B
Internal (audio) Sub-Carrier Generator	5 to 8 MHz, tunable, 1.25 MHz peak	**6.2 MHz, 6.8 MHz switch selected, 1.25 MHz peak**
Audio Modulation	Mono (400 or 1,000 Hz), stereo 1,000 Hz right, 400 Hz left	**1 KHz nominal**
Video Output	1 volt p-t-p, 75 ohms	**none**
Audio Output	300 mV p-t-p, 600 ohms	**none**
Powering	110 VAC, Ni-Cad with internal charger	**18 VAC, 0.5 amps load current, Ni-Cad charger**
Size	5.5 H x 10 W x 12.75 D with handle	**3.5 H x 8.6 W x 9.25 D**
Price		$995.00
Weight	8.3 pounds	**5.3 pounds**

As you can see if you are handy at comparing specifications, there is more to the (newer) 1600 than simply a reduction in price. In fact, the internal design of the 1600 varies quite substantially from the more complex (and feature laden) 2600. **In the 2600,** the designers first created a carrier signal on **925 MHz.** This signal was 'mixed' with a tuneable oscillator in the 2845 to 3345 MHz region and the 'sum' of these two oscillators arrived at the type N connector output in the 3.7 to 4.2 (TR1 to TR24) region. Along the way the unmodulated carrier was



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If this sounds like what you've been waiting for call us for more information or the name of the nearest Regency distributor at 1-800-428-1950.

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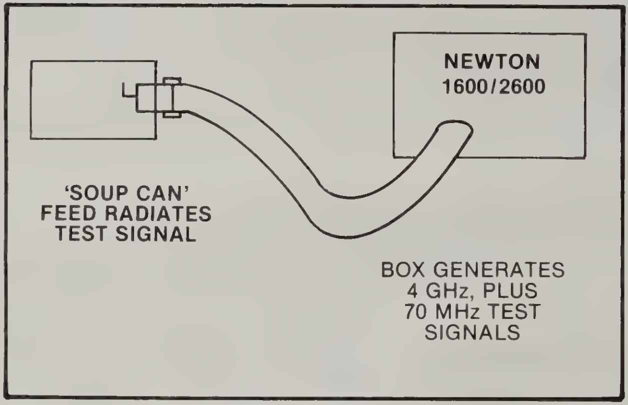
Regency Electronics Inc. • 7707 Records Street • Indianapolis, IN 46226 'further mixed' with the NTSC video signal which gave you a set of color bars on any transponder number you wished between 1 and 24. Additionally, an audio signal originating in the audio generator was also 'mixed' with the (video/bars) signal so you have an audio modulated as well as video modulated service in the satellite band frequency range. In effect, you were a very (very) low power (satellite) transmitter capable of transmitting on any channel you wished.

Then to create the **70 MHz** signal, Newton mixed the original 925 MHz signal with a separate oscillator on 855 MHz (925 − 855 = 70) and the 'difference' between these two frequencies became the 70 MHz output signal. The same video and audio modulation was available on the 70 MHz output as on the 4 GHz output.

The 2600 'machine' had many applications, as we shall see. It also had many 'applicat**ors**' including a few who went in and substituted their own video and audio input connectors so they could drive the gadget with a VTR deck or other 'suitable' audio and video source, and in effect create a 'locally' fashioned service. Just in case you think that has no real application, two stories (both true) will illustrate.

Just about one year ago while some 20,000 homes were tuned into the HBO channel on the Fort Lauderdale (Fl) cable system, right in the middle of a blockbuster movie the 'flick' disappeared and on the screen appeared this 'character' dressed in a cape and top hat. In five minutes time he told the shocked audience how they could 'beat the cable system' and tune in HBO and other premium service channels for a lifetime 'fee' of $100. He offered them a 'cable converter box' and told them how to get the box. Then he bid them adieu and disappeared from the screen returning the folks to their blockbuster movie.



A government service agency, with three initials in their name, needed a short (two mile) video and audio link to allow them to keep an eye on a visiting public dignitary. They wanted to do it quick, 'dirty' and for very few government dollars. They set up a camera and connected the camera to a small brown box and then used the box to connect to a small 2 foot dish which they pointed at a receiving site two miles away. There they set up another (4 foot) dish, an LNA and feed, and an off-the-shelf TVRO receiver. No wires, two miles covered, very few bucks.

Both 'operations' had one thing in common; **Newton 2600 test sets.** The cable TV interloper parked himself a half mile from the cable headend and fed his Newton 2600 into a two foot dish. His −20 dBm signal, fed into the dish (through a short length of 213, a cable to waveguide adapter, and a 'Chaparral Polarotor feed') was more than enough to totally block out the normal HBO transmission from a satellite nearly 24,500 miles away. He simply 'overrode' the bird's signal and the TVRO receiver in the cable headend never knew what hit it. The three-letter federal agency group used the same technique to squirt a 'secure' signal across the two mile stretch.

Newton of course does not like to hear of such 'mis-use' of their creation. And the 1600 model will help cut down on such shenanigans since the designers have limited the system to transponders 1, 12 and 24, without some intelligent internal re-adjustment. But Newton was far less concerned about **mis**-use than they were about **non**-use. The 2600 was perhaps 'too much box' for the typical TVRO dealer and they felt they needed a lower-priced box which would be easier for the typical dealer to fit into his 'test equipment budget.'

SYSTEM Uses

Breaking into HBO or transmitting clandestine video (and audio) aside, the more mundane uses of the system are as follows:

1) At 4 GHz

The basic system sitting out there in the weather consists of a TVRO parabolic reflector, a feed of some sort, an LNA, a cable or double-male connector carrying the amplified signal to the downconverter, and the downconverter installed at some point close to the dish. Up to the point of the input to the downconverter, everything is within the 3.7 to 4.2 GHz range.

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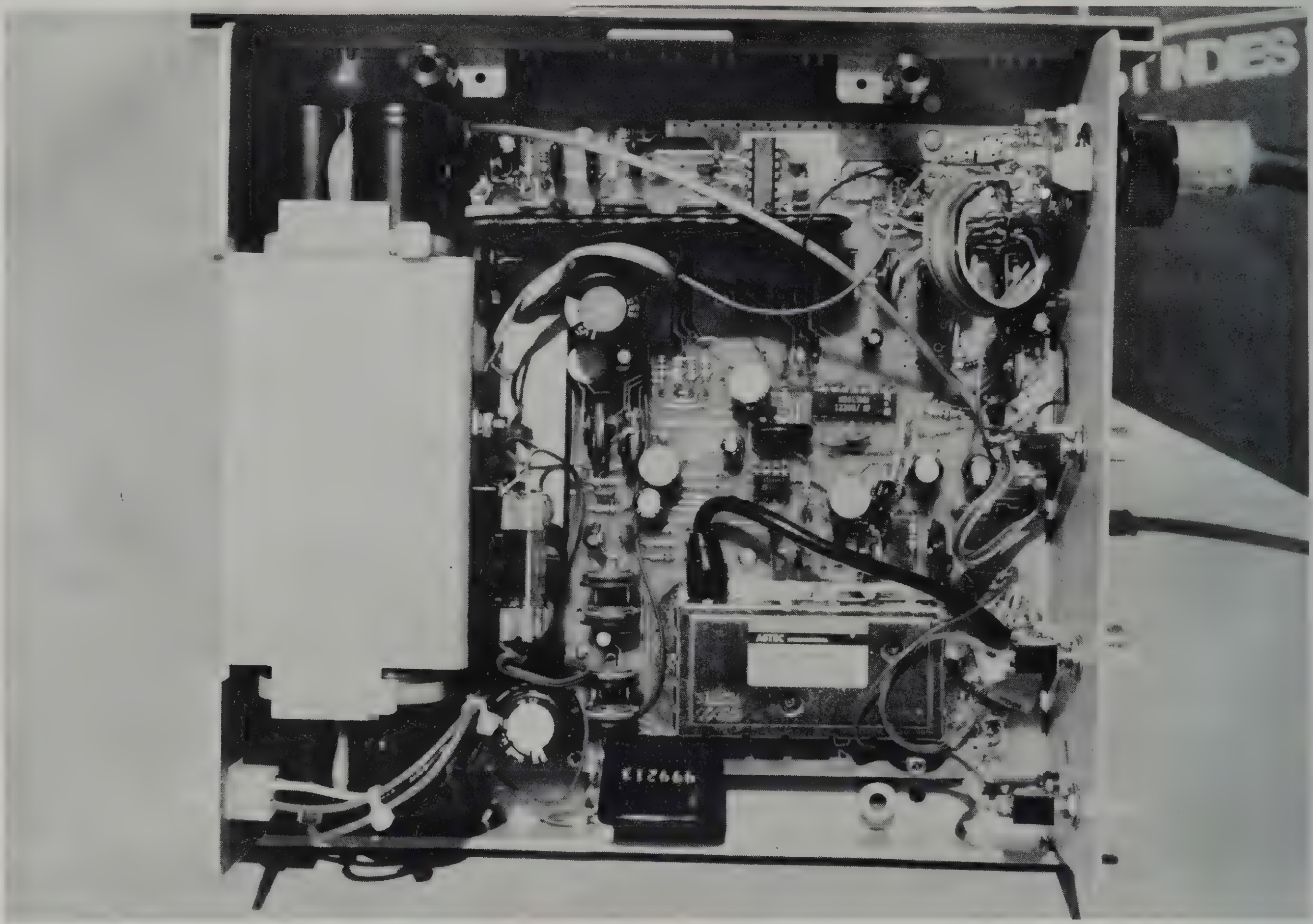
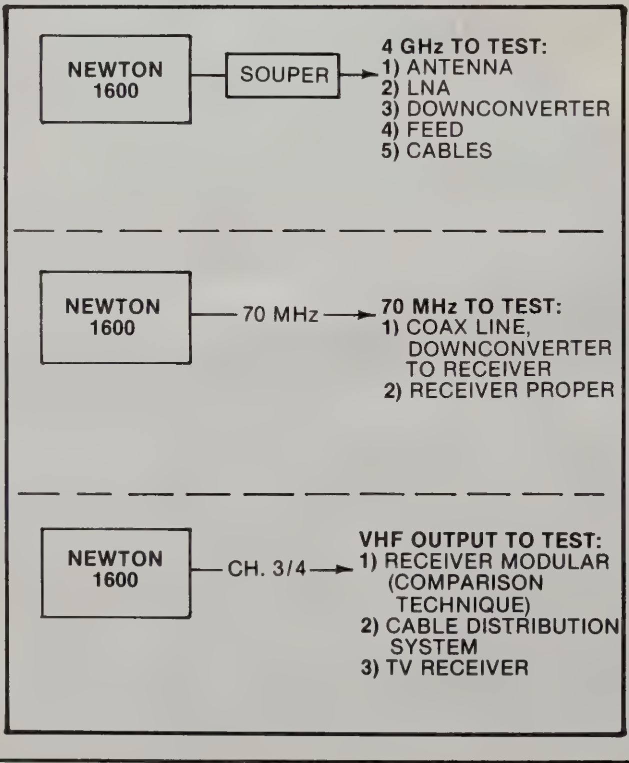


INSIDE the 1600, we have a single microwave oscillator plus the support hardware.



seems to have disappeared, where do you start looking for problems? Without some instincts or guidance, you will end up changing-out every part in the system after the reflector and up to and including the downconverter before you determine the cause of the problem. It could be electronic, it could be passive. It may be none of the above; maybe the dish simply 'slipped a cog' and you are two degrees below the satellite belt!

Enter the 1600 or 2600 machine. Now you have a quick 4 GHz signal source. Turn it on (using its internal Ni-Cad batteries for power), connect the N type output connector to the 'Souper Antenna' supplied with the unit, and go 'fishing.' Simply walk up close to the dish (several hundred feet is often close enough) and hold the Souper Antenna in one hand and point the Souper at the dish. If the dish is operating, and if your TVRO receiver is tuned to the same channel you have the 1600 set on, you will instantly 'see' and hear your 1600 signal on the TVRO receiver; it is 'so strong' that it simply overrides the receiver. As they found out in Fort Lauderdale one night.

Now, suppose everything is working, but not very well; say you have water in a fitting between the feed and the downconverter. From a distance of several hundred feet, you don't find the signal. So you walk closer (and closer) and then there is a faint signal which gets stronger as you move closer to the dish. Now you have an inkling of the nature of the problem; if you can **normally** 'override' the system from a distance of 200

TESTER/ continues on page 26

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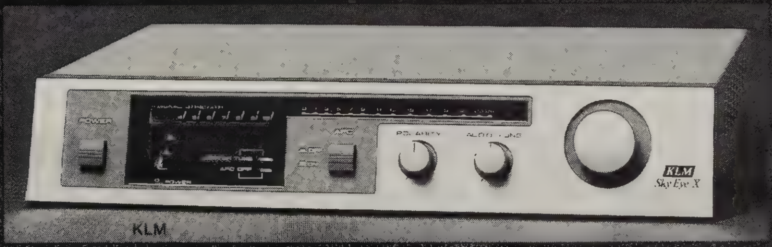

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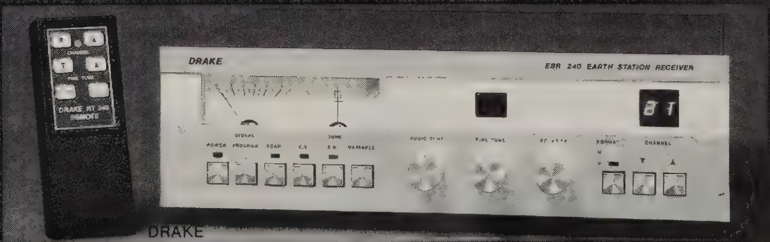

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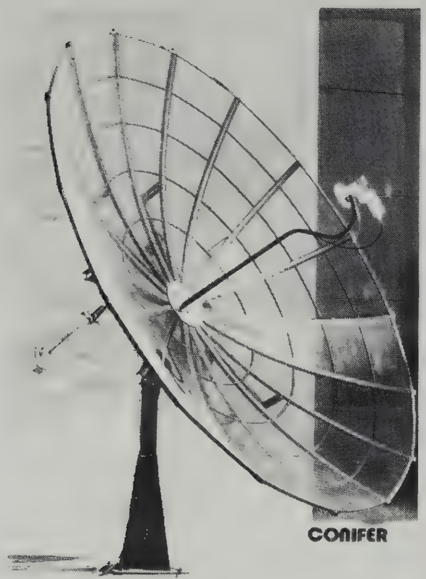

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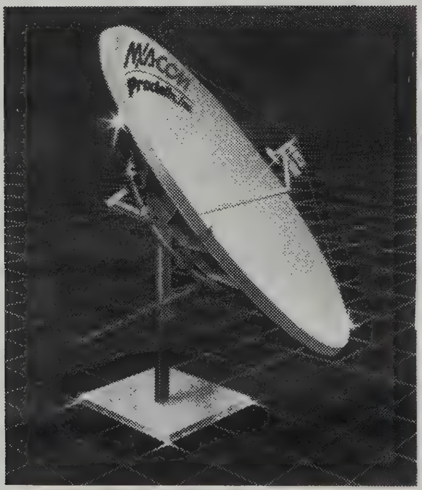

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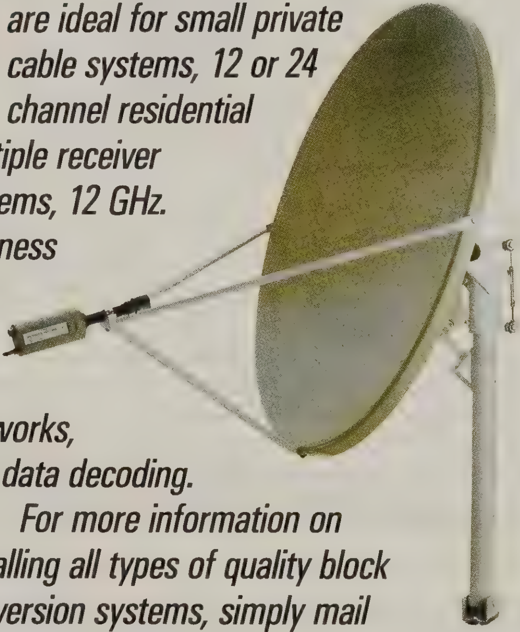

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TESTER/ continued from page 22

feet but with this particular installation you are down to 20 feet before the 1600 is breaking through, you know you have lost either an LNA, a cable/fitting, or perhaps the downconverter. You'll find out **which** very quickly.

1) Start at the **downconverter input** and connect the cable going to the 'Souper' antenna directly to the downconverter input N fitting. If the signal is overpowering, the downconverter is OK (the −40, −20 switch for the level of the signal, found on the **older 2600 model,** was very handy here since you could 'calibrate' the performance of the downconverters in use between the two [high power or −20 and low power or −40 dBm] positions).
2) If the signal is OK there, move to the opposite end of the cable that connects to the downconverter coming from the LNA. Using a double female fitting, conect the output of the 1600 directly to the cable to the downconverter. If this still results in a big, fat signal, you know the cable (or double male fitting if the downconverter mounts at the dish) is 'OK.'
3) Now we are 'up to' the polarization rotator and the LNA. If you re-connect the 'Souper Antenna' back up and poke the LNA and the Souper at each other, you have a fair idea of what is good or bad. If you 'mount' (as in stabilize in a fixed position) the Souper on the back of the antenna and slide off the polarization device/feed, the signal should go **down** by about half power on the receiver. If it stays the same, or comes up in level, the feed is bad.

So by process of deduction, in about as much time as it took you to read this outline, you can pinpoint the failure in a system and get on with replacing the bad part. Obviously that is far faster than simply taking off a part at a time and replacing it totally with a spare to see if your problem cures.

Now actually, for a modest test equipment investment of around $995 (give or take discounts) that **should be sufficient incentive** to rush out and order a 1600. Or a 2600 if you can still find one **(***).**

But there is more; much more. Let's assume that after going through all of the parts in the system, up to and including the downconverter input, we found no sign of signal. Or let's say that a different way; suppose you **started** with the 4 GHz **input** to the downconverter **and found no service?** What does that tell you?

Simply that the downconverter, or at least something **after** the input to the downconverter, has failed. But where? Remember, coming out of the (typical) downconverter, we are now at 70 MHz, not 4 GHz.

Fortunately Newton has thought about this possibility and if you remember back to the specifications, the same box also has a 70 MHz output on it. For just this type of situation. Now you swap output connectors on the 1600 and shift to 70 MHz. And you start with the line that runs from the output of the downconverter inside to the receiver. If you now have signal, that instantly tells you that the downconverter itself is bad. If you **still** do not have signal then the problem is either in the line or at the end of the line; the receiver proper.

Inside you start at the input to the receiver, where the 70 MHz input line plugs in. If you now have signal, the line is bad. If you still do not have signal, something in the receiver (or after) is bad.

Now we deviate since the 2600 has some features the 1600 does not have. The 2600 has a video and an audio output (NTSC bars and audio tone). If your receiver has a separate modulator, you could use those baseband signals to check out the modulator. With the **2**600. In the case of the **1**600, you don't have baseband signals but you DO have a built-in channel 3 or 4 modulator. Which gives you a roundabout-way to check out the TV set anyhow.

So you have all of the basic test signals you need to pinpoint a cause of failure and by starting at the **input to the downconverter** and working backwards **or** forwards, as the

---

***/ They never caught the guy in Fort Lauderdale since the entire episode was intended as a giant prank in the first place. The address and telephone number he gave turned out to be a non-related private residence of a person who had no involvement with the episode. The message he gave was quite real, however; underground cable converters for $100 proliferate in many cable areas, a subject broached by Coop on his **Boresight** (TV) **Commentary** this past January 17th. Oh yes, a 2600 equipped for 'transmission purposes' at a trade show might be a useful tool. One way to coerce exhibits into **tuning out MTV** would be to locate yourself on a building across the street and to the southwest and simply direct a new transmission back down into the show site parking lot on TR11. Let's see what type of interesting tape you could prepare to squirt down on the sea of dishes in the lot; a special message from SPACE? Bob Dushane explaining how he cornered the Taiwan electronics market? How about resurrecting a John Rohner videotape from San Jose in July of 1980 as he explains his $1600 LNC/receiver and promises delivery 'next week'!

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first check suggests, you will in short order isolate your problem and know what must be done to effect a cure.

Now, what other changes are there in the 1600 since we have discovered a couple in the 'operational area'?

When the 2600 first was introduced (late 1982), there was of course the 'option' of creating a TV signal directly at 4 GHz (i.e. 3.7 to 4.2 GHz) without having to start lower (925 MHz) and 'mixing' upwards. But, the voltage tuned oscillators in that era were **(1)** not terribly stable, and **(2)** not inexpensive. So the **start-low** and 'mix-up' technique was followed and this allowed them to also adopt a 'mix-down' technique (925-855) to create the 70 MHz signal in the same process. This was effective at the time, but the 70 MHz signal was subject to the instability (even at 925 MHz, there was some) of time and temperature and its (70 MHz) signal would wander abit (within the range of several MHz). This made some users less than happy, **on a production line,** since this 'drift' did not make 70 MHz alignment work very repeatable. The 1600 does it in a different way.

The newer unit uses a pair of separate oscillators; one on 70 MHz (which has a ±200 KHz or 0.2 MHz stability) and a second directly in the 3.7 to 4.2 GHz band. Time has improved the stability of the 4 GHz region oscillators and today the direct-in-band oscillator of the 1600 ends up with the same stability spec (±5 MHz frequency tolerance) as the older mix-up technique of the 2600. And it all costs less money.

Newton apparently felt that the slightly complicated audio section of the 2600 was not 'paying its way.' Remember that they had **(1)** a tuneable sub-carrier oscillator that covered 5.0 to 8.0, **(2)** mono and stereo modulation with a clever technique of placing the right channel tone at 1 KHz and the left channel tone at 400 Hz (this helps you sort out right and left!) as well as the baseband audio output for separately checking a modulator. The 1600 replaced all of that with a pair of fixed-tune audio channels; one on 6.2 MHz and the other on 6.8 MHz (frequency stability and tolerance for neither are specified but there is little likelihood that off-frequency operation would occur badly enough that the system would not play properly).

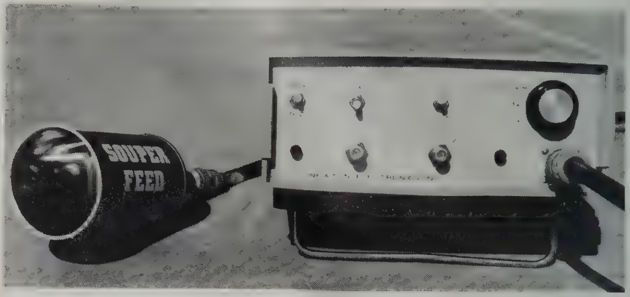
USEFUL Differences

Having identified how the newer 1600 differs from the older 2600, it might be useful to walk through some use-exercises where one does a job and the other does not. We are doing this for a purpose; Newton seems determined to cut-off production on the 2600, having, they believe, learned that what the 'industry' wants and needs may not be the same as what they originally conceived as desirable.

We'd like to see them re-think the 'kill-the-2600' decision for some of the reasons given here.

1) The 1600 gives you a channel 3 or 4 RF output (bars, tone). That's handy for checking a TV set, a quick RF source for validating a mini-cable distribution system, and so on. The 2600 does not have channel 3 or 4 output capability **but it could easily be added** (they use a commonly available Far Eastern modulator for this purpose and the 1600 measured RF output level is +16 dBmV).

2) The 2600 provides selectable mono audio, discrete stereo or matrix stereo outputs. If we were running a service shop, it is probable that this would be used **now and again.** How else can you quickly prove that the often-complex audio demodulator segment is operating properly? But, there are some complex and costly circuits in place to do this and this is one of those marginal features which could go either way (i.e. is the price increase justified by occasional use?).



3) The 1600 has switch selectable 6.2 and 6.8 subcarriers. The 2600 gives you the full frequency range from 5 to 8 MHz. But, **there is no dial calibration** on the sub-carrier range and no spot-selected positions. Why do you want a tuneable sub-carrier generator if you have no way to calibrate where the generator is tuned? Why do you need more than 6.2 and 6.8 anyhow since virtually no receivers provide switch selected spot frequencies other than these? There is a compromise possible here; retain the full tuning range of the 2600 but add two spot-set positions on the control to correspond to 6.2 and 6.8. Then to make the tuneable portion really useful for the service shop that has to pre-set say a 5.8 MHz sub-carrier on a receiver, the sub-carrier oscillator signal should be brought out of the (2600-**A**) unit in a test jack. Into the test jack you would plug in a low-cost frequency counter. With a counter connected to the sub-carrier oscillator (at a point prior to the application of modulation), you could dial up 5.800 or anything between 5 and 8 and proceed to set your fixed-frequency receiver adjustments.

4) The 1600 has a 'fixed' output level on 70 MHz and in the 3.7 to 4.2 GHz range. The 2600 has switch selectable 'hi' and 'lo' outputs which are 20 dB apart in level. The 1600 is spec'd at −30 dBm (more than enough to 'take over' a cable system; a pair of 10 foot dishes, lowered to the 'horizon' and pointed at one another do a very good job over a five mile terrestrial path with the 1600 as a transmitter and a standard 100 degree LNA, feed and receiver at the opposite end). The 2600 has −20 dBm (10 dB hotter than the 1600) or −40 dBm levels. The switchable levels for 70 MHz (−40 and −20 dBm) are the same as the 4 GHz outputs.

One of the early uses we found for the 2600 was to feed its output into a section of 213, then through a coax to waveguide transition and connecting the transition to the input flange on a standard LNA. This gave us a 'secure' non-radiated connection from 2600 to LNA and with it you can grade LNAs. However, even the −40 dBm level is far too hot to check out even a low grade LNA (too much signal available) so a handy way to attenuate the 2600 signal had to be devised. We located some 4 GHz rated (microwave) step attenuators and lowered the signal into the −90 dBm region, ultimately, to be able to 'calibrate' LNA thresholds. We'll review this 'quick and dirty' LNA grading technique in greater detail in a subsequent issue of **CSD.** In talking with Taylor Howard about building a variable (linear) attenuator into the 2600, we jointly came to the conclusion that it was far simpler and far more reliable to do the attenuation 'outboard' of the 2600. The need, however, for an LNA and/or downconverter calibration device is very much evident and the 2600 or the 1600 provides the **basic** stuff you need; i.e. a microwave signal, properly modulated.

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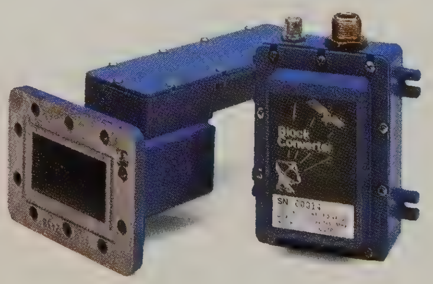

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Can't you just point the Souper antenna at an LNA on the bench and do the same thing? Unfortunately, no. Radiating the Souper directed signal through the air, in a shop or out in the open, subjects the received level through the open mouth LNA to variations caused by the 'signal path.' At these frequencies, moving things just 1/8th of an inch can cause considerable changes in level; we found opening and shutting a door into the room caused us to vary from S4 to S7 on a signal level meter! To do this **right,** you have to **bottle up** the energy inside of coax and feed the LNA or downconverter 'direct.'

5) The 1600 has a very handy voltage sensing circuit; a front panel LED which lights up when there is voltage on the coax line you are plugged into. In effect, if you disconnect the cable line at the LNA, coming from the downconverter, and there is voltage on that line, the LED 'fires.' You get the same action when plugging into the 70 MHz line coming to the downconverter. So without a VOM, you have a visual indication that the powering voltage for the equipment is present, or gone. There is not such a circuit in the 2600.

6) The modulator in the 1600 is worth additional mention. It is front panel switchable from channel 3 to channel 4. We measured +16 dBmV output on channel 4 and +11 dBmV output on channel 3. However, we found that the channel 4 output retained **both sidebands** (including the non-wanted lower sideband) while the channel 3 output dropped the unwanted sideband by a respectable amount. Bottom line? Use it on channel 3 when practical, not 4.

7) The 2600 has a plastic handle which is convenient for carrying and field use. The 1600 has a metal fold out 'stand' which is handy for nothing but setting the unit on the bench. Either one would benefit by having a 'shoulder strap' and we eventually retro-fitted our 2600 with a strap left over from a VCR deck.

8) Both units have Ni-Cad rechargeable batteries. Useful life-cycle with the batteries properly charged is around 2 hours of continuous use (you would have to use the AC portion to 'show' War and Peace!). You don't want to take either unit into the field and 'leave it on' accidentally.

One solution to this, found in many CATV field strength meters, is to provide a carry-case (with a strap) and then build into the case an automatic shut-off when the cover is snapped over the front of the unit. Most users would prefer a case with a strap, and most users would fold the cover back on the unit after using it, **automatically shutting the unit off.** A small point, but one that shows 'hands-on' experience in the 'real world' of field technicians.

SUMMATION Comments

Newton Electronics is onto a good thing. They seem to have the expertise to deal with the typical TVRO installation person frustrations but some of what they have done shows a lack of understanding of the actual daily uses which a field person would put such a box to. Perhaps because the first model, the 2600, ended up going primarily (because of price and timing) to the OEM market, they ended up talking with **bench people** more than **field people.** The 1600 is an apparent attempt to strip out features which perhaps the bench people found less than useful, but in doing this (and lowering the price), the field people may find it less useful than the earlier 2600.

There is nothing like the 1600 in the market and once you use one for a day in the field, we doubt very much you will ever leave the shop again without it. It can shorten a typical 'It doesn't work" service call from hours to tens of minutes and in the process give the user the tools he needs to make definitive measurements. In 'Comments' this month, we lament the lack of TVRO dedicated test equipment and point out that many of the installation errors and problems faced by the dealer could be avoided if he had better 'test equipment tools' to work with. The 1600, and the earlier 2600 model, are an excellent step in this direction and **CSD** encourages every dealer with a concern about his own future to invest the dollars required to have a 1600 in the shop. You'll not regret the purchase.

CSD TEST:
RANGER
SCREEN MESH

ANOTHER Antenna

When **Les Addison** of **Ranger Antenna Manufacturing** contacted us regarding a **CSD Lab Test** for their 11 foot screen mesh antenna, we were both on unstable footing. Les was not quite sure he wanted to send an antenna down to the Turks and Caicos Islands, torn between the advantages of possibly favorable publicity and the dis-advantages of our telling it like we found the antenna to perform. We, in turn, had very little prior knowledge concerning the Ranger antenna line. We had seen a couple at trade shows and they sort of blended into the forest of antennas like so many others. But we had no strong feelings, one way or the other, and the only data we had accumulated had come from some dealers who had primarily written to complain about a long list of products (including Ranger antennas).

Our primary concern with the antenna was how well it would hold up in what most now recognize is a 'hostile antenna environment.' A considerable number of TVRO antennas, many from sizeable and prominent manufacturers, have come to Providenciales, been tested, and within a few months begun a slow but irreversible accelerated decay. So we decided to install the antenna on the top of a bluff where the winds are constant and where salt spray and other corrosive elements would speed up any deterioration that might occur. Then we'd do our initial measurements, allow the antenna to sit for 90 days or more, and return to inspect it closely as well as do additional measurements.

The Ranger 11 foot screen mesh dish is panelized. No clips. The dish assembles in a 'common sense' manner; the hub assembly goes on the support post and the panelized sections are fitted, one at a time. Two men, an hour to an hour and a half. Not a big deal and the pieces fit reasonably well together.

RANGER 11/ continues on page 34

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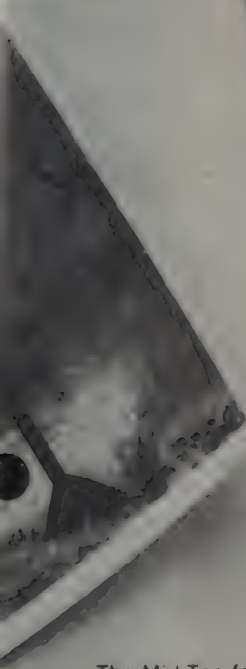

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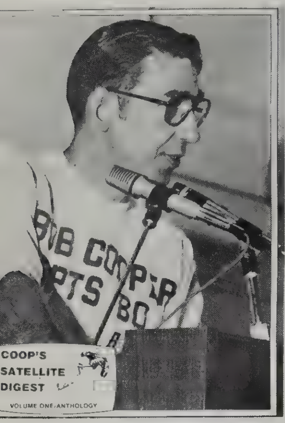

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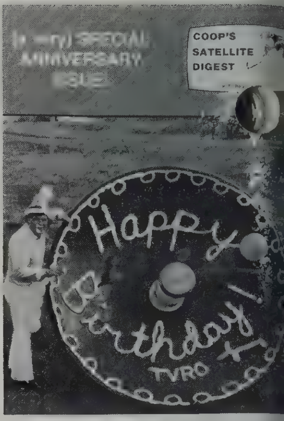

CSD's **'Fifth-Birthday-TVRO'** issue (October 1984) . . . telling the story of how the TVRO industry evolved, developed, and fought its way into the billion-dollar consumer world. Where the equipment came from, where the rules and regulations came from, how the industry leaders developed. This is the full story of all of the major points as our technology and industry developed. **From $36,000** home terminals in 1979 to the $995 home terminals of 1984; **from 16 foot dishes** that did NOT move to 4 foot dishes that blend into the roofline. **From $3,000 LNAs** to $99 LNAs, the trials and tribulations and the big events that shaped and created an industry which many believe will become **the-number-one** consumer electronics industry of the late 1980's and 1990s! If you want all of the important facts, and an easy to use industry reference book, this special CSD Fifth Birthday Issue is for you. And the price is right; 180 pages, **$15** shipping charges paid, worldwide.

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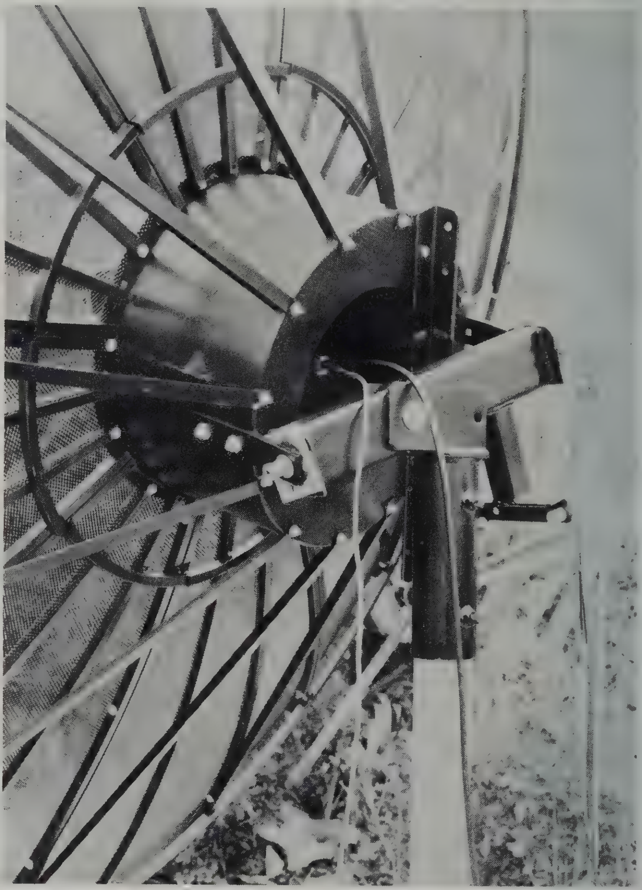
Ranger's instruction manual surprised us; it is very complete and although it obviously was primarily intended for their solid-panel (as opposed to screen mesh) antenna series, even a neophyte could work his way through without major problems. Subjects covered include 'Site Location,' 'Mount and Hub Assembly,' 'Polar Offset (declination) Adjustment,' 'Panel Assembly' (for the solid surface model), 'Aiming Procedures' and 'Getting The Dish To Track.' There is sufficient information that a new dealer should be able to make it play the first time. An experienced hand will be comfortable with everything about the antenna since it is very straightforward.

Ranger also supplies, in the manual, line drawings for the setting of the support post and a section on 'Trouble Shooting' which covers such subjects as 'No Signal,' 'Degraded Picture,' 'Sidelobe Interference,' 'LNA Not Centered' and that enigma of all dishes, 'Warped Dish.' There is also a section on preventative maintenance (wind bracing, snow removal) which tells us Ranger would rather educate people than spend countless hours on the telephone trying to straighten them out AFTER they have made a mistake.

The design of the 11 footer is relatively straightforward; Ranger has not broken any new design areas. What they have done is to simplify the dish and its parts so that nobody should be likely to get confused with its assembly or operation. There is one interesting wrinkle, nonetheless; a tri-legged type of support is used to stabilize the buttonhook feed away from the center-plate surface. Buttonhooks have a way of vibrating about and anyone who has used this type of antenna knows well that if the end of the feed moves in the wind, the pictures suffer. The support is a good idea and while no support of this type may eliminate totally buttonhook vibration, it will certainly 'dampen' those vibrations.

QUICK REFERENCE SPECS
Manufacturer: Ranger Antenna Mfg., 1961 S.E. 'N' Street, Grants Pass, Oregon 97526; 503/474-6050
Size: 11 foot diameter (aperture)
Feed: Prime Focus
Weight: Under 300 pounds with mount
Price: $465.00 dealer net (depends upon quantity)
Gain: CSD estimated 41.0 dB
Assembly Time: Two men, under 90 minutes
Construction: Primarily aluminum, petalized segments
Assembly Manual: Above average

TEFLON WASHERS plus grease insures that the mount declination-offset arm will not rust and freeze up on you.



STRUCTURAL support to hub from panelized sections provides frame-stiff antenna in light to medium winds. Our 'temporary' **3" OD pipe mount should be properly side braced for permanent installations, however.**

The entire center portion of the dish is solid, providing both an anchor for the tripod buttonhook supports and the petalized mesh panels. This also contributes to dish stability. Adding to this we have rear braces which tie to the hub proper, also at the rear, in a fashion not unlike early ADM solid surface (11 foot) dishes. And surrounding the circumference of the dish, close to the hub proper and just inside from the outer edge, there is another relatively massive circular 'ring' which provides additional panel supports. The dish is well thought out, and rigid.

We elected not to install it with the support braces which the instructions suggest, and could see that the only thing that was giving on us in the wind was the 3 inch pipe we used as a support mount.

A few minor flaws aside, the Ranger 11 appears to be a well designed dish. Its weight versus size ratio (nearly 300 pounds for 11 footer) is about what one would expect with a quality dish. We did notice that on the inner (near the flat metal plate) circumference ring that the assembly person might have missed his 'jig' on one section resulting in an out-of-alignment butt-to-butt alignment.

WEATHERing

Our primary concern was with the way the antenna might take the environment. The majority of the antenna materials are aluminum, and while mis-handling or poorly applied paint-

RANGER 11/ continues on page 38

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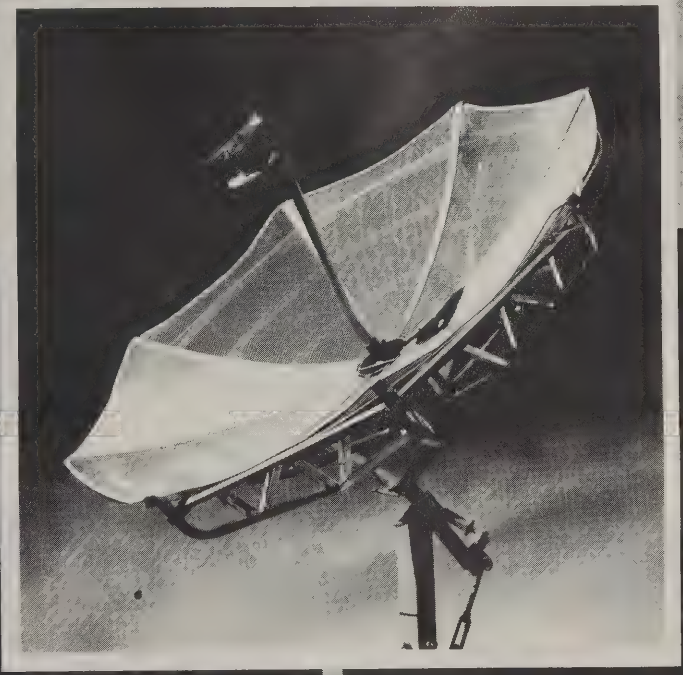

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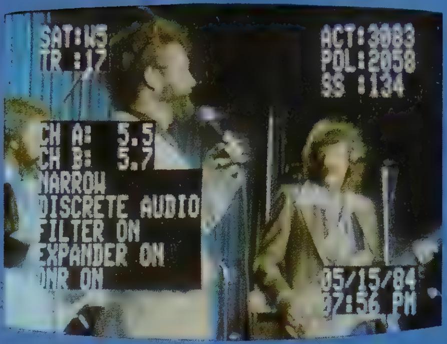
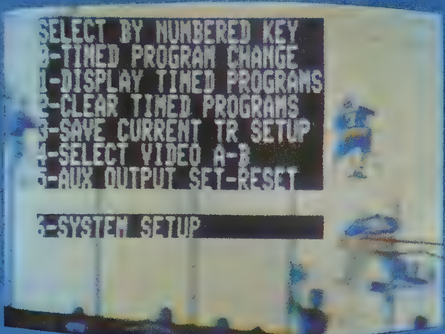
InterCeptor II Satellite Terminal

K.I.S.S. Engineering

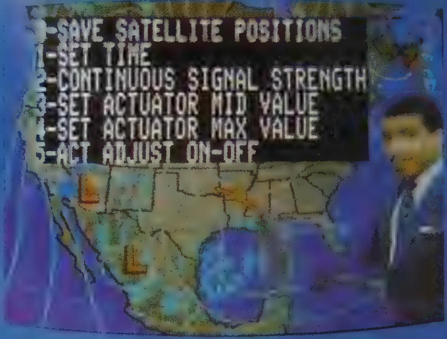


```
SAT:W5          ACT:3083
TR :17          POL:2058
                SS :134
CH A:  5.5
CH B:  5.7
NARROW
DISCRETE AUDIO
FILTER ON
EXPANDER ON
DNR ON
                05/15/84
                07:56 PM
```

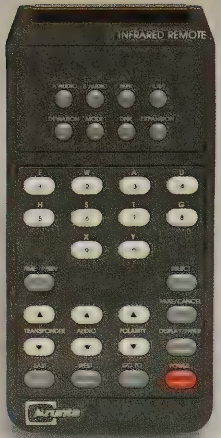


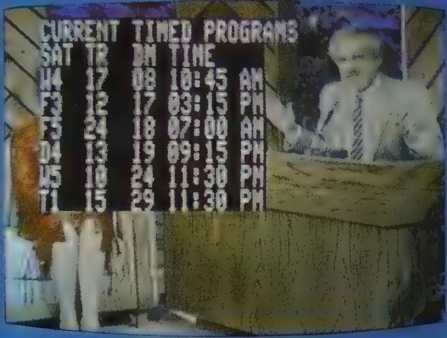
```
SELECT BY NUMBERED KEY
0-TIMED PROGRAM CHANGE
1-DISPLAY TIMED PROGRAMS
2-CLEAR TIMED PROGRAMS
3-SAVE CURRENT TR SETUP
4-SELECT VIDEO A-B
5-AUX OUTPUT SET-RESET

8-SYSTEM SETUP
```



```
0-SAVE SATELLITE POSITIONS
1-SET TIME
2-CONTINUOUS SIGNAL STRENGTH
3-SET ACTUATOR MID VALUE
4-SET ACTUATOR MAX VALUE
5-ACT ADJUST ON-OFF
```





```
CURRENT TIMED PROGRAMS
SAT TR  DM TIME
W4  17  08 10:45 AM
F3  12  17 03:15 PM
F5  24  18 07:00 AM
D4  13  19 09:15 PM
W5  10  24 11:30 PM
T1  15  29 11:30 PM
```

8:00 PM

You press button 4

InterCeptor II Functions:

Checks parental lockout memory for this satellite and transponder and decides it does not need the combination; takes control of sync, mutes audio, adjusts polarity; synthesizes transponder 4 frequency, displays "TR4" over video on your TV, synthesizes audio A frequency at 5.80 MHz, synthesizes audio B frequency at 6.80 MHz, switches from narrow to wide deviation, turns on expansion, turns off filter, turns off DNR, unmutes audio, regenerates sync, releases control and awaits your pleasure.

9:00 PM

You press GO TO

InterCeptor II Functions:

Takes control of sync, mutes audio and requests "SAT?" over video on your TV.

You press W 4

InterCeptor II Functions:

Looks up satellite position in memory, decides which direction to go to the satellite and the correct direction to arrive from. Requests "TR?" over video on your TV.

You press 1 1

InterCeptor II Functions:

Checks parental lockout memory for this satellite and transponder; adjusts polarity, synthesizes transponder 11 frequency, displays actuator position and signal strength over video on your TV, tells actuator to go 200 counts past satellite and return to exact position for W4, turns off A and B audio and expansion, turns on filter and DNR, turns on video B aux. input, external descrambler and stereo audio aux. inputs, displays video B on your TV screen, checks sync and regenerates, unmutes audio, releases control and awaits your pleasure.

1:00 AM

You are asleep.

InterCeptor II Functions:

Remembers timed program you entered last month, initiates GO TO G 1 2 0

Turns on your VCR to record programming.

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ing has resulted in minor chipping of paint surfaces, the aluminum (in 90 days) shows no bad signs. It shouldn't. On the other hand, where steel parts had chipped, we had rust. We also had rust quite uniformly on 'plated hardware' and very few actually hold-up in a salty environment, nor one with heavy chemical pollutants in the air. We found moderate rusting of boltheads and nuts after 90 days.

We also found one spot on the hub, where the 'seam' is formed, which had been 'welded' but not properly cleaned after welding. When the black paint surface was applied, the improperly cleaned seam-weld had not been coated properly and the salty air got inside. Nothing was falling apart in ninety days time, but unless the antenna was resurfaced in this one particular spot, within a year or less serious rusting would result.

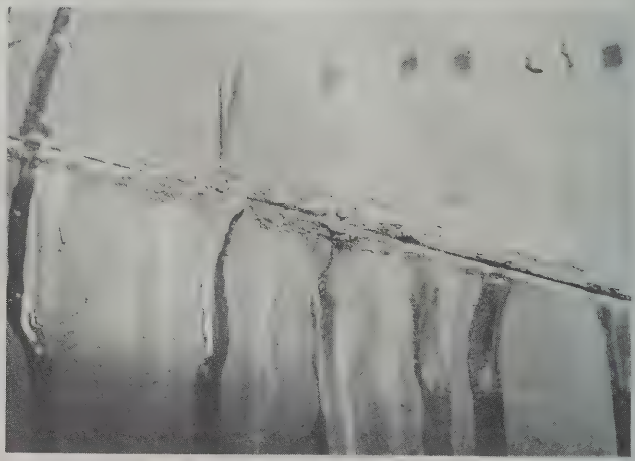
PERformance

An 11 foot prime focus antenna of this type should have gain just over 41 dB. We found the performance to be equivalent to the current series of ADM solid-petal (fully parabolic) 11 foot antennas and around 1 dB lower than one well known **12 foot** antenna.

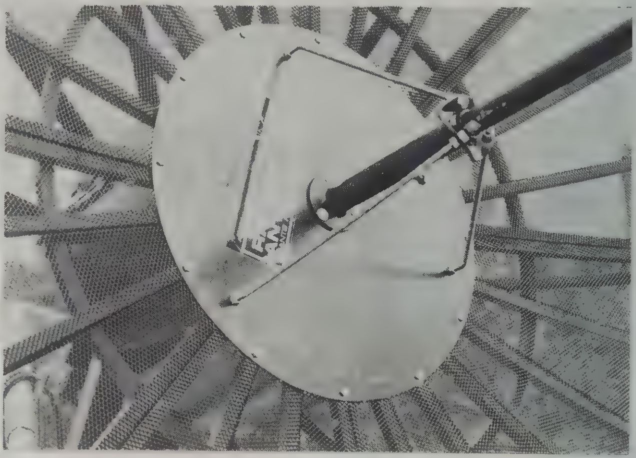
In other words, it does what it is supposed to do, with performance that is expected of any well designed screen mesh antenna.

Specifically, the antenna had no unexpected (or nasty) 'sidelobes' and the adjustment of the focal length was within 1/2" of the calculated distance (indicating no unusual warping). Sighting 'across' the surface, and 'stringing' the dish to verify the centering on the prime focus feed indicated the dish was properly shaped and true to itself surrounding the circumference.

DISH IS basic black and virtually 'opaque' **to surroundings.**



IMPROPERLY cleaned seam on hub weld was only rusting spot (other than some 'plated hardware') **we found after 90 day environmental test.**



TRI-SIDED support, tied back to the solid metal center plate, anchors prime focus feed in place and allows the installer to zero the feed in at the center of the 'hot spot.'

SUMmary

The people at Ranger have evolved their antennas into a product line which performs well, is designed well, and assembles without installer hassle. Our 90 day testing and inspection revealed no serious design flaws and other than the plated hardware which would eventually require replacement, and a slightly less than 'sanitary weld' on the seam of the hub in one spot, the antenna seems to be weathering properly.

There is nothing 'fancy' about the product nor the instructions; both provide good value for the dealer or customer's money and if the antenna we received for test is representative of those now being manufactured by Ranger, the firm should do well in the dealer marketplace during 1985.

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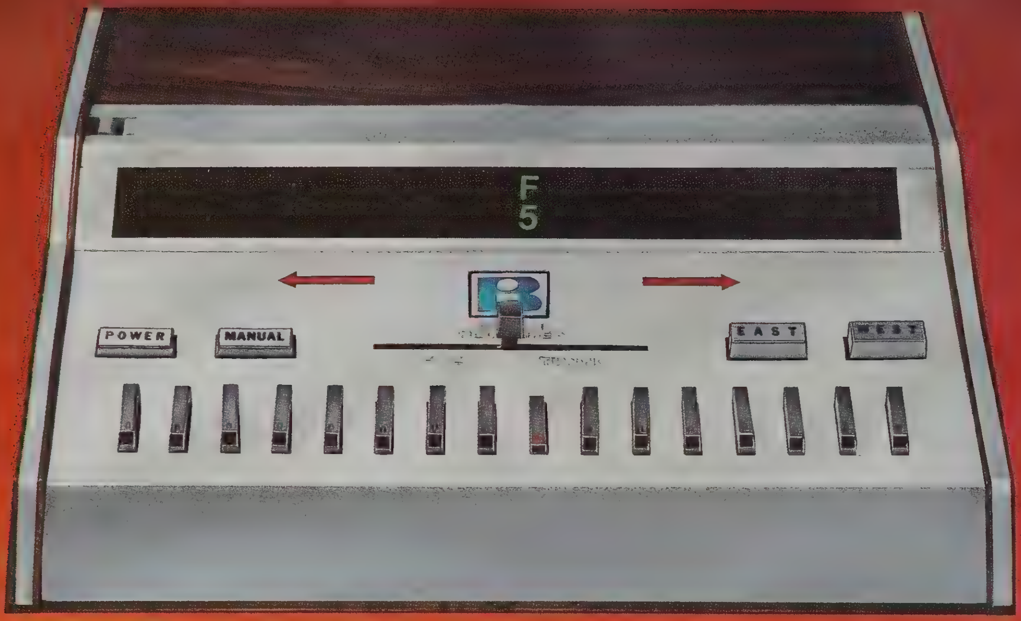

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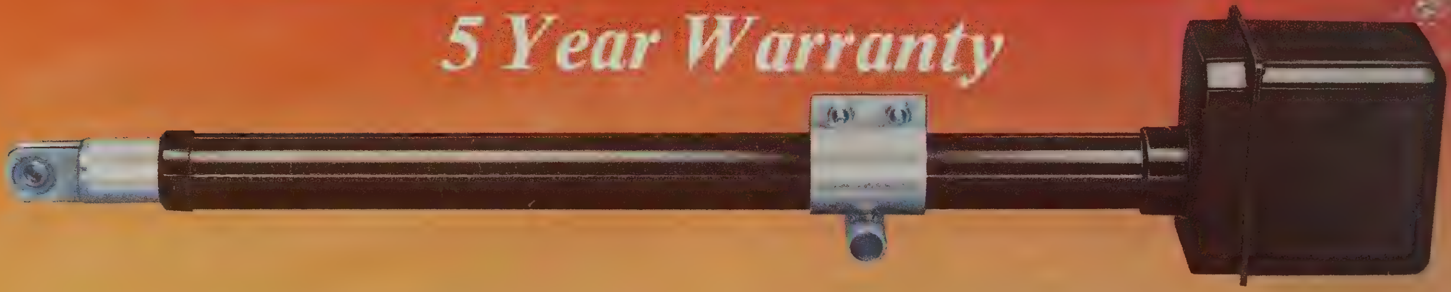

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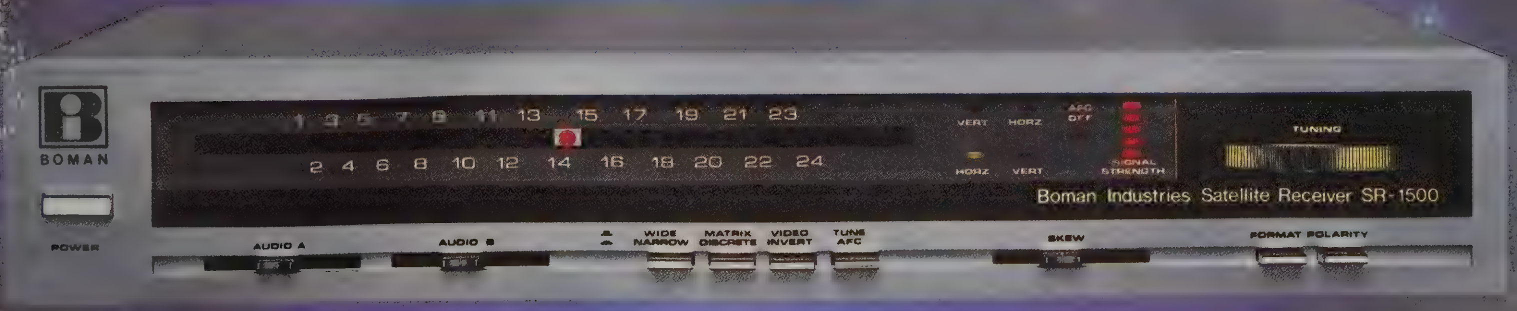

In spite of its modest price, the SR-1500 delivers video performance that can challenge any receiver on the market. And, it delivers *STEREO* sound for less than most monaural units.

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- *TV CH 3-4 Modulator*
- *LNA/Down Converter Voltage Retained*

And, the attractive slender design of the SR-1500 will make it a welcome addition to any family entertainment center.

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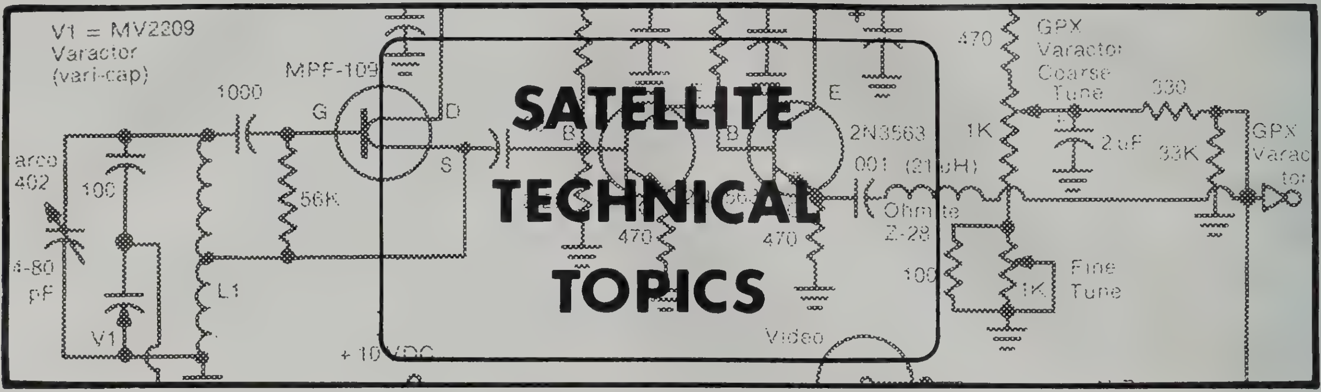

SATELLITE TECHNICAL TOPICS

Signal Level Meter

Several issues ago **CSD** dealt with the 'art of being good,' or knowing when you have peak signal performance from your satellite dish installation. Subsequent issues carried letters from readers who were having varying degrees of success with metering systems. One, from a reader in Oklahoma, asked about any 'quick circuits' to create a metering system for the 70 MHz 'IF line' found in many of the common receivers now in use.

There is very little to say about the metering circuit shown here except to note that it assembles quickly, does not require any parts you cannot locate in any medium sized Radio Shack store, and it works very well. The 70 MHz IF signal is looped through the unit (see left hand side of schematic) so the metering system can be put in line with the 70 MHz IF coaxial cable. This gives you use of both the normal receiver as well as this external metering system. Powering on the 70 MHz line will not 'get into' the metering circuit because of the .001 capacitor at the input to the first transistor amplifier stage in the meter.

by
Norman F. Nollett
Nollett Electric Company
118 West 2nd Street
Valentine, Nebraska 69201

The unit is self contained **(see photo)** and will run for a very long time with the 9 volt Alkaline battery shown. The 5K pot (upper center in schematic) allows you to adjust the sensitivity of the meter to compensate for very weak, or very strong, signals while still having adequate meter display range. The meter is simply a 100 microamp meter. The entire package can be installed in any common self-sealing housing found at Radio Shack or other parts supply stores.

The powdered iron slug should be one that is rated for VHF use and coil winding details are sketched with the schematic. I believe you

SCHEMATIC (page 43)/ continues on page 44

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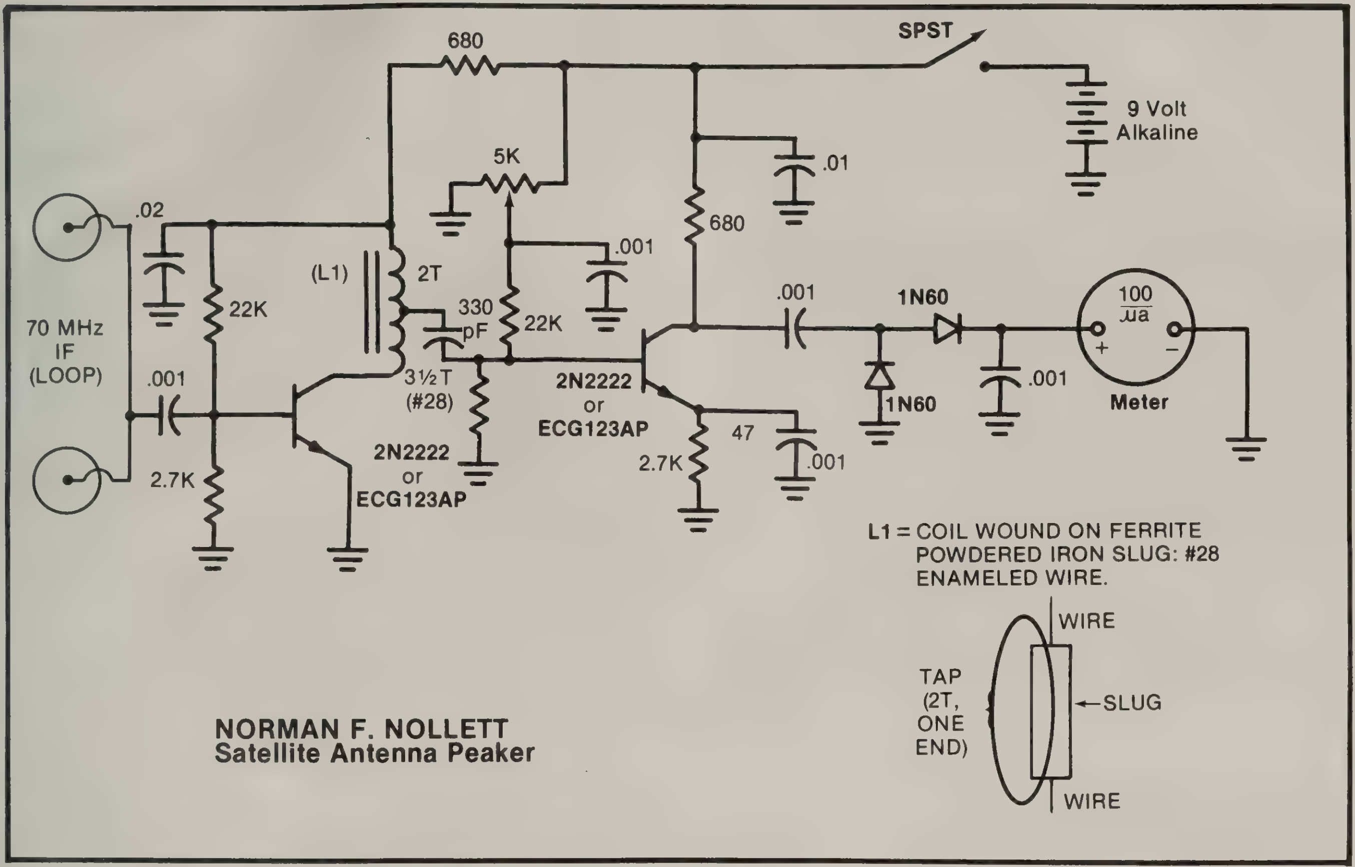

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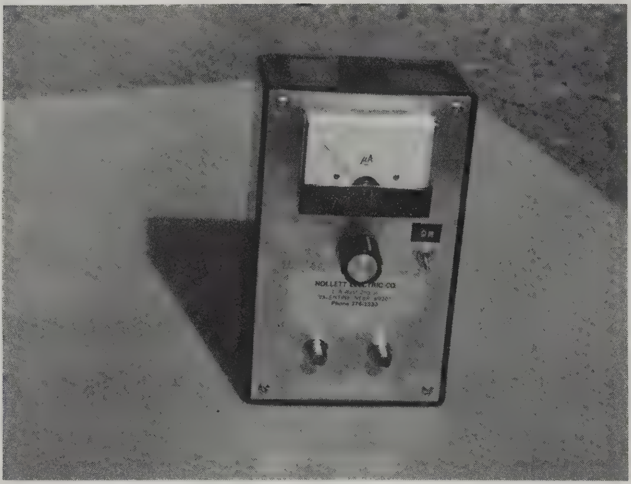
TECHNICAL TOPICS/ continued from page 42

will find, as I have, that once you use a sensitive metering system when aligning a satellite dish, you will never again make an install or check a system without this handy gadget in your tool box. It saves countless hours of fruitless signal searching and makes getting the last fraction of a dB out of an antenna system a matter of precision rather than guessing.



TVRO/ Five Years Ago (*)

Plans to create an 'LNA kit' using precisely designed circuit boards and 'characterized' GaAs-FETs have run into difficulties. **Taylor Howard,** working on the project, reports that even with pre-tested GaAs-FETs, the variation from FET to FET is so substantial that the builder is still forced to optimize (and tweek) each LNA stage. Lacking test equipment to do this, the project seems 'dead' as a field-item. LNAs are still $1,200 each for 120 degree units.

Clyde Washburn begins a series in CSD describing how you design an 'optimized' TVRO receiving system, taking the readers through the system equations and providing step by step planning assistance. The same issue advertises "The TVRO Receiver You've Dreamed Of . . ."; the first of the Washburn (Earth Terminal) units.

Homebrew antennas are featured, ranging from fiberglass to solid metal to screen mesh. **Jack Burkett** of Oklahoma had built a ten footer using 1/2" conduit for ribs and 1/8th" hardware cloth for a reflector surface. **Randall Odom** had a 10 foot fiberglass antenna available for $850 FOB Beebe, Arkansas.

Steve Birkill's 'hybrid mode feed' is described in detail, with particular attention paid to the 'scalar ring' design he used. The feed would figure prominently in some tests in Miami at the SPTS show, bringing down the first Intelsat reception to a private terminal antenna. **RCA's F3 bird,** launched in December, had disappeared. Nobody could find it and the cable programmers who were 'lined up' to use it were in a quandry. Cable growth, for the immediate future, looked 'stunted.'

Steve Birkill also wrote about the 'US visible' Gorizont bird as well as the Molniya birds. A detailed analysis of the bird's flight path was printed so adventuresome North Americans might look for the Molniya birds. It would be the month of May before anybody was successful in this effort.

CSD also reported the death of **Oliver Swan,** the man who pioneered spherical reflector antennas for TVRO. Swan's genius was his intuition rather than any formal training and he left behind a wealth of practical information which hundreds would emulate in the years ahead.

NEC Microwave Semiconductors made a startling announcement; a 1.5 dB noise figure GaAs-FET for $35 or a 1.2 dB noise figure device for $50. Prices to this point had been in the $250 region. LNA pricing would certainly come down in the months ahead.

***/ From CSD for February 1980.**

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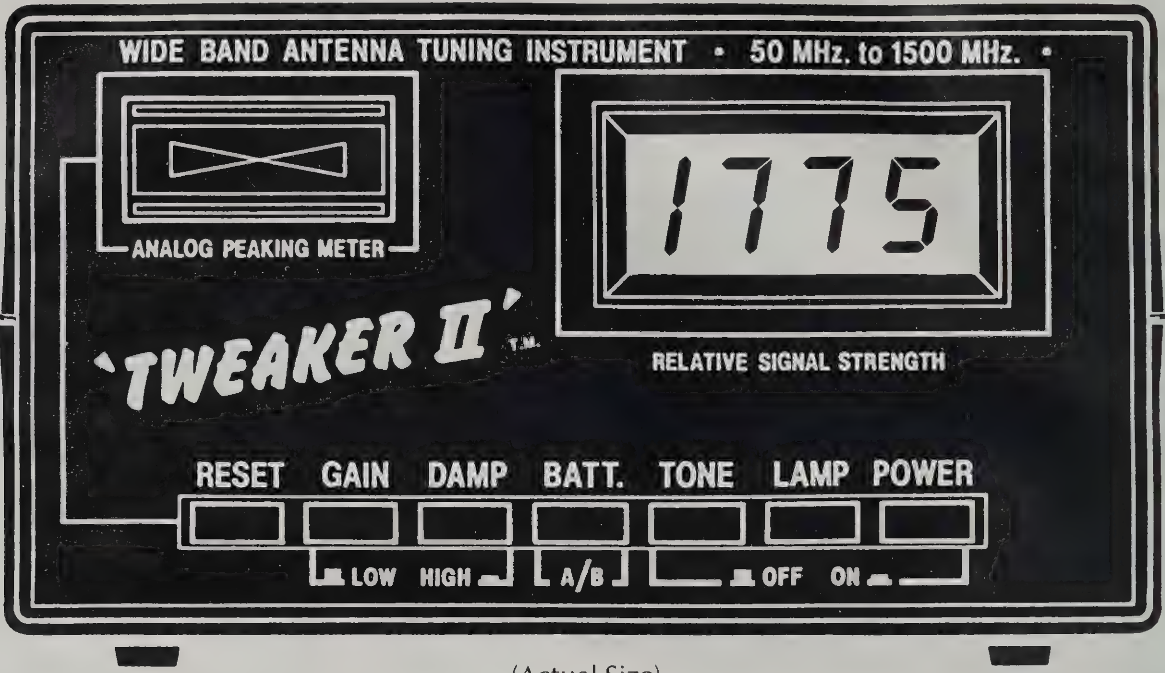

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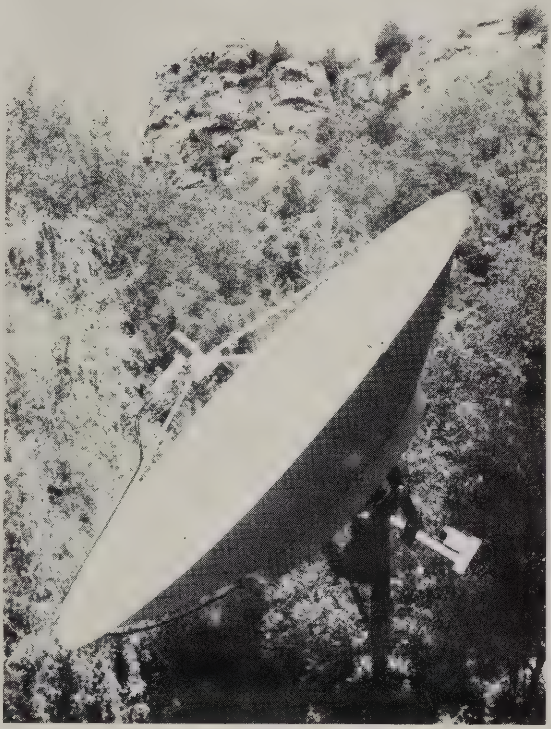

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PIONEER'S PIONEER/ ARTHUR C. CLARKE

CLARKE IN MOSCOW/ Arthur C. (right) **with Russian Intersputnik Director-General Yuri Krupin. Clarke toured Russian space and satellite installations in the summer of 1983; an honor accorded few from outside of USSR.**

BACKground

Arthur C. Clarke, for those who joined us after the semester began, is an Englishman residing in the Indian Ocean, in the country of Sri Lanka. Clarke has not always lived in Sri Lanka; he was born in England and educated there. He served in the English military during World War Two, and was one of the people responsible for the operation of the first military radar. It was during his stint with the RAF that he fine-tuned his mind on the subject of space flight and space-use. Shortly after the end of 'the war' he would publish in the English publication **WIRELESS WORLD** a technical paper describing his 'vision' for a worldwide satellite communications system. Clarke's concepts, drafted formally in 1945 but taking form in his mind for several years, created the technical parameters for our existing geo-stationary (now called Clarke Orbit) satellite system.

Clarke describes the events in his life, prior to the Wireless World article (October 1945) and after, in a book published by John Wiley and Sons (**Ascent To Orbit**; 1984). Here he traces his boyhood in England and the things which captured his fancy leading to a profound interest in space and communications. Clarke could have easily spent all of his life teaching higher mathematics at an English University. He also could have spent all of his life creating electronics or managing electronic assembly lines in his native England, or anyplace else in the world. He elected to create for himself a lifestyle based upon following those challenges in the world which most fascinated him. He would become one of the world's leading experts on 'scuba diving' and eventually would play host to both American and Russian 'astronauts' in his adopted Sri Lanka, leading them on underwater 'safaris' beneath the Indian Ocean.

Clarke would ultimately become famous and best known for his writings; he would discover, early in the 1950's, that he possessed sufficient writing talent to make his living in this work-fashion. His writings would be split, by title, almost precisely 50% fiction and 50% non-fiction although most of his fame would come from the fictional material. With approximately 25 'titles' in each of the two-categories, his books would line library and private bookshelves all over the world.

Some of his works would be turned into film **('2001: A Space Odyssey'; '2010; Odyssey Two')** while others would be aired worldwide on television **('Arthur C. Clarke's Mysterious World,' 'Arthur C. Clarke's World Of Srange Powers').** He would be commissioned by the Editors of 'Life Magazine' to create a public-image for the exploration of space, and ultimately, in 1982, he would be bestowed with one of the world's most prestigious civilian awards; **'The Marconi Award.'** This 'award,' neither the first nor the last to be given in recognition of his literary and scientific contributions to the advancement of communications technology, came as the direct result of his original WIRELESS WORLD technical article penned back in 1945.

Clarke is so rightfully 'the father of geo-stationary orbit satellites' that over the years there has been a gradual adoption of a new name for the geo-stationary orbit belt; it is now known, almost universally, as the **'Clarke Orbit Belt.'**

Clarke the Englishman living in his 'adopted' Sri Lanka holds a most unusual 'position' in world-power circles. His dedication to the advancement of human technology, and the preservation of the human species is well known 'on both sides.' He is equally welcome in Washington (DC) and Moscow (USSR). He is, as an individual, far more 'neutral' in his politics than his home country and for this reason he has been accorded public recognition and access to usually unreachable people in Russia as well as in the United States. He numbers amongst his friends and acquaintances virtually every person of stature in communications for the past 4 decades; from **Grote Reber** (the man who 'invented' radio astronomy) to **Dr. Wernher von Braun** (the man who created the rockets essential to the eventual launch of space communication vehicles; satellites). His interests remained so diverse and varied through the 50s, 60s and 70s that he would be invited to address groups ranging from college students at the University of Ohio to the United Nations. Each would find his thoughts incisive and his challenges to their own thought processes provoking.

Inspite of all of his successes and all of his acclaim, Arthur C. Clarke remains one of the 'nicest' and 'most hospitable' men in the world today. When a group of 25 'TVRO people' traveled from the United States, Canada and Japan to visit Clarke in the late fall of 1983, Clarke arranged for their comfort and accommodations as if all were part of **'his family.'** This particular group of 25 represented the worldwide 'home TVRO industry' and while spending seven days in his Sri Lanka, they installed a trio of 16 to 25 foot TVRO antennas (with associated electronics); donations to Clarke and his University of Moratuwa in Sri Lanka **(see** CSD **for January 01, 1984).** Clarke today, the result of this trip, has his own 'home TVRO' as does the Sri Lankan university he has endowed with the 'profits' from many of his awards.

Clarke recently attended the (December 6th) Hollywood premiere of his latest film epic ('2010: Odyssey Two'). He

CLARKE IN SRI-LANKA/ Clarke's 'family' in Colombo. Arthur's home, Leslie's House, is shared with his partner in the Underwater Safaris business and a growing family. All five recently attended world premiere of '2010: Odyssey Two' **in Hollywood** (December 7th).

professes to not enjoy those long, tiring, worldwide excursions of his youth and plans to spend more of his time 'at home' in Sri Lanka in the coming year(s). At the same time, his work schedule (he continues to spend 12 hours per day working on new manuscripts and following up old ones) remains exhausting. For those who may wonder about a sequel to '2010: Odyssey Two,' be advised that he has a target date of December 16, 1989 to turn in his material for **'The Final Odyssey.'** Those who are familiar with '2001' and '2010' will perhaps be amused to learn that 'The Final Odyssey' is set in the year **20,001.** If you have already seen '2010' you may recall the closing lines in the dialogue following the monolith's creation of a 'second sun' for our solar system.

Clarke's works are driven by his love of communications, his love of science, and his fervent hope (and prayer) that somehow man will make himself smart enough to avoid devastating his own earth with his technology. From his May 17, 1983 address to the United Nations, we quote an excerpt that is 'classic-Clarke':

> **"I wish I could claim that improved communications would lead to peace, but the matter is not as simple as that. Excellent communications** — even a common language! — **have not brought peace to Northern Ireland, to give but one of many possible examples. Nevertheless, good communications of every type, and at all levels, are essential if we are ever to establish peace on this planet . . .".**

Arthur C. Clarke has received many-many awards. Ours is by way of showing that **we recognize** and appreciate his vision and his staying power to stick with his 1945 treatise and to see it blossom into the most promising communications evolution in the brief history of mankind. Arthur C. Clarke; the one-man who started it all, for which we-all are very, very grateful indeed!

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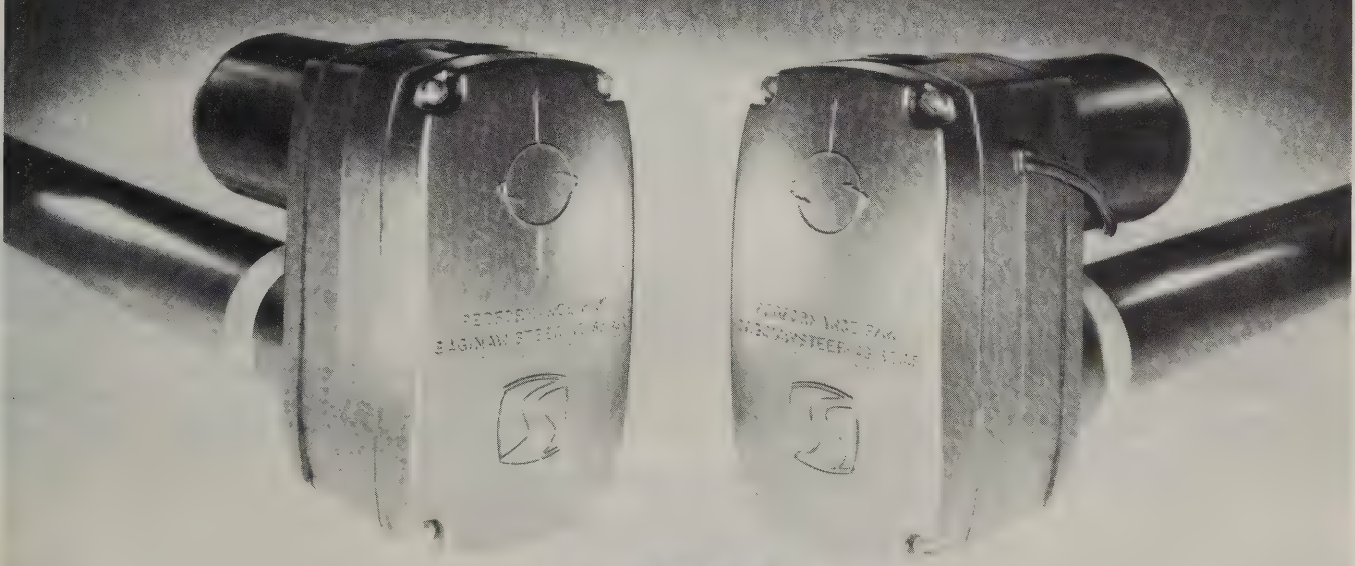
*/ 'Ascent To Orbit' detailed the story of how the geostationary satellite system evolved, first in Clarke's mind, then on notepads, and finally as a worldwide communications system. The full title is **'A Scientific Autobiography**/ ASCENT TO ORBIT/ **The Technical Writings of Arthur C. Clarke'** and it was published in 1984 by John Wiley & Sons. Highly recommended for TVRO enthusiast libraries.

Look for this brand name to be sure you get our Hi Tec 90 +® Antenna Positioners



Saginaw GM

*Registered Trademark of Saginaw Steering Gear Div., GMC

Manufactured by
Saginaw Steering Gear Division
GENERAL MOTORS CORPORATION • SAGINAW, MICHIGAN 48605 • (517) 776-4123

YOUR FINAL CHANCE.......
TO COLLECT ALL EIGHT PIONEER LITHO PRINTS OF OUR INDUSTRY

NOW EIGHT

Way back in the July (1984) issue of **CSD** we offered you the opportunity to collect, free of any charge, a very special set of caricature Litho Prints for the eight 'founding members' of the TVRO industry who have been recognized for their 'pioneer contributions' to TVRO. With this month's 'nomination' of **Arthur C. Clarke,** we bring to a close this special eight month **CSD** series. This is your last opportunity to collect all eight of these handsome caricature prints.

CSD has recognized that valuable 'cornerstone' contributions have been made to the industry by individuals who participated in some event or brought forth some technology laying the foundation for the modern TVRO industry. These individuals were honored by all of the industry on September 3 (1984) in Nashville, Tennessee at the **CSD TVRO Fifth Birthday Party.** More than 1,000 members of our industry attended this event and saw these awards being presented. Of the eight so honored, only Sri Lanka's Arthur C. Clarke was not in attendance. Each month since July **CSD** has recorded the contributions of an individual in this group and with this month's writings about **Arthur C. Clarke** this project comes to a close.

Your office or TVRO store can have all eight of these 11 by 14 quality litho prints at no cost. Each characterizes the contributions of an individual and each 'tells a TVRO story.' To receive your full set of eight, complete the application form below. **This is the last time all eight of these prints will be available and the remaining supply is limited.**

SIMPLE RULES

All that is required is for you to complete the application form below, returning it to **Boman Industries** at the address indicated. There is no charge nor obligation for these prints at this time. Begin by completing the questions below, and then fill in your name and shipping address:

1) **Would your store/business** 'promote' HBO and other scrambled services if HBO configured the marketing plan so that you received **nothing** for your effort? ______
2) **Would an HBO marketing plan** which 'skipped over' all of the TVRO industry and went directly to the TVRO consumer be a 'fair plan' for our industry, in your mind? ______
3) **Are you in favor of accepting** an HBO marketing plan for 'CBD,' or urging our industry to push for a plan that involves **us** as a part of the marketing and sales strategy? ______

YOUR NAME/Address

____ **SEND ME ONLY** the Arthur C. Clarke Litho Print; I already have the first seven prints in the series.
____ **SEND ME ALL EIGHT** Litho Prints, free of charge or obligation.

NAME ______
COMPANY ______
ADDRESS ______
TOWN/CITY ______ STATE ______ ZIP ______ COUNTRY ______

Return application form to:
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Downey, California
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NOTE: This offer expires **March 15,** 1985 and will **not be repeated** in CSD.

General Instrument is the name that guarantees you a better reception in the SMATV market.

Products, service, competitive prices, and over 25 years of experience in manufacturing quality TV reception products for consumers, businessmen and the cable TV industry are the reasons why you should specify General Instrument on your next SMATV project.

Quality dish antennas in 8′, 10′, 12′ and 15′ sizes are available, of course. But to get to the heart of the headend look at our receivers and modulators designed specifically for the SMATV market.

Our C4R synthesized tuned, block input receiver and C4LNB 120 low noise block downconverter have advanced satellite receiver technology. Now you can offer your customers CATV performance with these SMATV products.

This frequency agile receiver system has features and performance that are normally found in high cost products, yet it's extremely affordable.

Our frequency agile modulator, the FAM-300, is the industry's first low cost unit using SAW technology. Used with the C4R, it gives you superior performance plus the economy and convenience you need for saleable SMATV installations.

Quality products are not all we offer.

When you sell a General Instrument SMATV system, you have a team of our engineers and system designers at your disposal. They are ready to offer their technical knowledge and experience to help you penetrate the growing SMATV market . . . *and at no additional cost to you!*

Plus you also have the cost-saving advantage of buying everything you need, from dish antennas to wall jacks, from one supplier.

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519/582-0710

INDUSTRY AT LARGE

CORRESPONDENCE, NOTES, REBUTTALS AND CHARGES . . .

CSD provides this industry Forum with the understanding that opinions, thoughts and "facts" published are from the writers; no liability for statements extends to the publishers. Address letters to CSD/Industry, P.O. Box 100858, Ft. Lauderdale, FL 33310

CREDIT Where Due

Our firm, **Roundhouse Manufacturing Company,** did the original design work and the construction for the tracking mount created for the Russian Molniya service reception at Columbia University (see **CSD,** December 1984; page **36**). In a word, I am intrigued by mounts and more especially tracking mounts. I now recognize, through **CSD,** that there are many satellites other than Molniya which do not simply 'plop down' over the equator and 'stay put.' I am of course also aware that all Intelsat Grade terminals, constructed for the Intelsat system by its member nations, do indeed track or move so that the wanderings of the Intelsat birds can be followed with precision. Those types of mounts are designed, with attendent tracking electronics for positioning, for exceedingly large antenna structures. It is my design goal to provide packages which do the same thing for smaller dishes, say **up to** 30 feet in diameter, using the kind of 'tough structural integrity' which one must have with any dish designed to track in two or three planes.

Robert F. Crean
Roundhouse Manufacturing Co.
Box 1431
White River Junction, Vt. 05001
(802/295-6926)

Crean's work was a prominent part of the Columbia University Molniya tracking system featured in CSD **for December. The ECI 11 foot dish mounted at Columbia is shown here. ECI, by the way, will be announcing a 16 foot antenna very shortly. And Crean already has a tracking mount for it.**

LNA Claims

In response to the **CSD** article for November 1st (LNA Noise Temperature), would you please comment on the enclosed Norsat advertisement which compares their LNA to others available?

Regarding downconverter 'losses;' on one occasion we changed a Wilson downconverter from their Japanese supplier to one made in the US for Wilson. The Japanese unit had far greater noise and we asked Wilson 'why;' they told us both were of 'the same quality.' We are not so sure that is true.

We sell systems basically comprised of the 10 foot Prodelin antenna, an Astron (ADI) mount, MTI actuators with an 18" Warner jack and a consumer choice of the Wilson 400, the STS-MBS-ST or the Dexcel 1300-02. Our LNAs are all 100 degree or better and always 50 dB gain. We believe this is a good package which we have evolved to in several years of being a fulltime TVRO dealer. We look to **CSD** to advise on selecting LNA, downconverter and receiver components since few of us are in a position to test all of the many variations offered in the marketplace.

Gerald de Blok
Sat-Link, Inc.
P.O. Box 2307
Gulf Shores, Al. 36542

The NORSAT literature lists six brands of LNAs (Norsat, Amplica, Avantek, Cal Amp, MSE and M/A-COM). **The chart also lists 12 separate desirable features** (according to Norsat) **which LNAs should have. Naturally, Norsat has all 12 while others** (such as Cal-Amp and MSE) **have only one. Seemingly, if Norsat needed** all 12 **to produce a top-rate LNA** (they **are** an excellent LNA), **Cal-Amp and MSE would be virtually out of business since they had but one of the 12 desirable features. Both Cal-Amp and MSE manage to do very well in the marketplace so one must assume that if either wanted to** 'counter' **the Norsat LNA ad, they would simply create a list of 12 desirable features** for themselves. **If you selected the** 'right 12,' **chances are they would meet all 12 and Norsat would perhaps only get 1 or 2. At the CSD Lab on Provo we presently have around 40 LNAs in routine operation** (a precise count would take some time; 40 is close!). **All six brands mentioned plus Drake, Boman, Dexcel, Locom and Gardiner are represented in our Lab installations. We have the following non-scientific** observations:

1) We prefer LNAs **with input isolators** BUT get excellent performance from California Amplifier LNAs which do not have an input isolator;
2) For lightning protection we prefer **a ground input probe** but lose an equivalent number of both grounded **and** ungrounded

LNAs to **either** lightning damage **or** spikes/transients on the incoming powering lines;

3) We prefer **50 dB** (or better) **units** because of the ability to swap LNAs around to a wide variety of test antennas (23 now operational) where we have many different receiver systems connected (some antennas have a single, dedicated receiver; others have as many as 9 receivers on the same antenna and LNA) but understand why in hotter foorprint areas those 40 dB gain units will work properly;
4) We prefer units that have **individual test data** for each LNA but have long ago decided that the test data is virtually useless **anymore** since most LNA suppliers spot-check three places in the band and let it go at that.

GOOD Bye Dishes?

Enclosed is an article published in local Grant's Pass newspaper. It concerns a fellow who claims to have developed a TVRO antenna system which obsoletes dish antennas. What do you think?

Michael G. Knox
1149 SW Louise Circle
Grants Pass, Or. 97526

This is one of those 'Eureka' **inventions. The man has changed some basic laws of physics. According to the report,** Scott Starke **of** Merlin, Oregon **has created a package about the size of a TV set that weighs but a few pounds. The photo displays a small fiberglass container slightly larger than a bread box mounted on a stand which** Stark **claims you can point through any south-facing window. He claims that his antenna works** 'in reverse' **and rather than focusing on a single satellite, it sees up to six satellites at a single time. An antenna** 'the size of a bread box' **would have such a small aperature that it would do this anyhow. How** Stark **makes those mixed signals strong enough to view, or how he manages to** 'separate them' **all mixed together like that is lost in the newspaper story. He claims he has patents pending. He also claims the system works on the 12 GHz band as well as 4 GHz. Production of this** miracle **box?** Stark, **the newspaper report states, plans to go into production or license someone else to do the work in about mid-1985.** We'll see.

THE Well Equipped Home

After starting with TVRO in the late 70's, I continue to use a home-built Swan Spherical TVRO antenna with a homebrew receiver ala 1979, along with a commercial 4 GHz dish. I recently acquired a 12 GHz TVRO of the type being installed in the northeastern USA for the USCI version of 'DBS.' I installed it in my greenhouse and am amazed at the results. Even the half transponders from ANIK C3 produce quite acceptable pictures and the full transponders in use by USCI on C2 are almost good enough for cable headend use (I will not yield to the temptation, however!). I have had a couple of years experience with the Canadian 12 GHz service for cable but this was my first shot at home style 12 (11) GHz reception. This particular package is being retailed in the $1600 (Canadian; $1200 US) range complete with roof mount. I understand from some friends in the Maritime region of Canada that they are selling very well there although I have not seen very many here (100 miles northwest of Toronto) yet. I do intend to offer them for sale in my 'video store' although I, like the rest of us, am apprehensive over the future of USCI. We currently market the Drake line of receivers with Andrew antennas and have excellent results at 4 GHz. Oh yes, our recently elected Canadian Prime Minister now has his own 4 GHz TVRO!

J.G. Milligan
Satlink Limited
244 St. Andrews Street West
Fergus, Ontario N1M 1N7
Canada

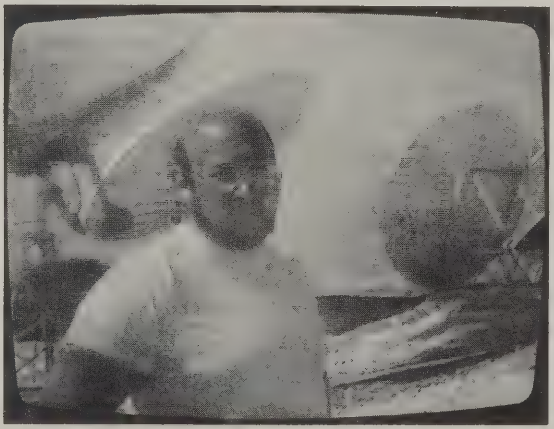
Jake's 'greenhouse installation' **and some sample results are shown here. Milligan has appeared in** CSD **previously; first with a** 'Silo antenna' **(a converted metal silo top intended for farm use) in 1980, and as the creator of special tests conducted in Haiti** (1982). **His full photo set shows the 12 GHz antenna lovingly placed next to a hot tub where the** 'modern family' **can watch their**

BORESIGHT

ON THE TUBE . . .

1/31

FIBERGLASS antennas are coming apart from coast to coast. Shoddy workmanship? Poor quality materials? Find out who and what is to blame as a fiberglass expert takes you to school! Rick Brown ponders HBO's plans to 'bundle' services and suggests they are not the ONLY ballgame in town!



Your Industry's Weekly
Video Showcase!

NOW YOU SEE IT—

NOW YOU DON'T.

THE 'Protected Feed' of the Southern Star Satellite 7.8 (foot) TVRO antenna is a common sense answer to unwanted signals getting into your receiving system.

GOOD-BYE TI!

EXCLUSIVE Cassegrain feed design PLUS 'Microwave Fence' shrouding insures that terrestrial interference signals don't wander into this innovative antenna. A significant percentage of TI problems are solved without traps or filters!

HELLO LOW-NOISE!

SPECIAL 'shaped-beam' cassegrain feed 'steers' antenna side lobes away from 2 degree spaced satellites AND terrestrial noise. You get BIG antenna performance with a dish under 8 feet in size; a real technological improvement in system performance. AND coupled with new ultra low noise LNAs (55 degrees and 50 dB gain!) from California Amplifier, you have an unbeatable package. Get the full story from your exclusive SSSA distributor; Promar, Inc.

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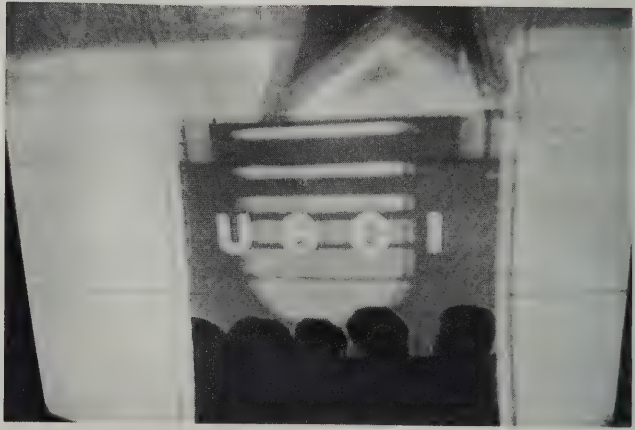

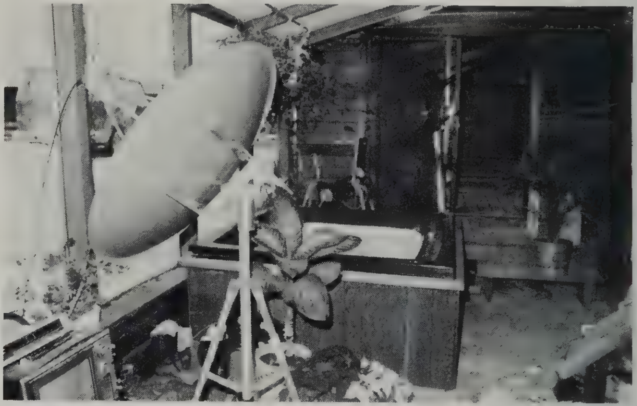

satellite TV while soaking away the pains of a day's labor. Some life! (Yes, that is 'snow' outside.)

BETTER Numbers

We felt that our displaying at the Dallas STTI show was a success although it does concern me that many of the 'established distributors' seem like the Missouri 'mule;' they have to be hit over the head with a 2 x 4 to get their attention. I would think that after the extensive technical publicity given our 4 foot package in **CSD** and the operating display of the service in a show such as Dallas, there would be fewer 'doubting Thomases'! I have asked Mr. Allen Pawlowski, (an MEE with General Instrument / Jerrold Division) to prepare some link calculations for our 4 foot spun dish using the 85 degree LNBC electronics which we have selected. I thought they might be of interest to the more technical members of our industry.

Blair A. Gilbert
President
Galaxy Broadcast Services
P.O. Box 349
Kulpsville, Pa. 19443

Pawlowski reported to Gilbert "At best the antenna noise temperature will be close to 50° K with a (**Philadelphia area**) look angle approximating 15 degrees. Using the Galaxy 1 transponders, in the best case (**the horizontal, or odd numbered**) channels will exceed receiver threshold by 0.5 dB. This will produce an excellent picture with no snow but there is virtually no room for system or link degradation. On the other hand, the less powerful vertical G1 transponder (**even numbered channels**) will in the best case be −1.5 dB reference threshold. With the electronics package specified (**23 MHz bandwidth for video, 85 degree LNBC**), the receiver input range is from −10 dBmV to +25 dBmV for 'snowfree' video. This indicates, upon calculation, that we have a permissible line loss of 20 dB and with the RG-6/U cable in use, there is 8.3 loss per 100 feet in the worst case. Thus, with that cable the LNBC could be situated as much as 241 feet from the receiver and there would still be adequate transpon-

Southeast Satellite

DISTRIBUTORS INC.

FINALLY, A HIGH PERFORMANCE DISTRIBUTOR FOR A HIGH PERFORMANCE ANTENNA

Largest Stocking Distributor
for Paraclipse 16 ft, 12 ft, & 9 ft antennas

New location opening Oct. 15; Ft. Lauderdale Florida,
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We Ship Worldwide.

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Technical Inquiries Phone 904 824-1915 or 824-5434 / Telex-523303

ders." **Pawlowski found the carrier to noise ratios 8.5 dB** (best case). **Galaxy Broadcast package, from GBS, offers an alternative approach to marketing low-dollar-end systems** (see **CSD** for October 1, "Isn't This DBS??").

THE CANADIAN TVRO SCENE

by MARK LEWIS, 2 BRAEMORE GARDENS
TORONTO, ONTARIO M6G 2C8

NEW VIDEO TRAINING TAPE
a 30 min. tape that clearly presents the basic installation principles common to ALL antennas
INSTALLING SATELLITE ANTENNAS©
★ Site Check
★ Dish & Mount Assembly
★ Aiming & Tracking
★ Troubleshooting
EXCELLENT for: Training New Dealers/Installers
"Install-It-Myself Customers"
VHS and BETA II
Also: SATELLITE TV BASICS© (a 13 min. sales-aid)
SHELBURNE FILMS
54545 SR 681
Reedsville, Ohio 45772
(614) 378-6297

ANYWONE WANT TO BUY A Slightly Used Satellite?

Admitting that the supply of satellite transponders has "temporarily" exceeded the demand, Telesat Canada recently announced that it will put one of its 12 gigahertz Anik-C satellites on the block, for sale, but Telesat was quick to point out that they were not desperate to sell, so it is unlikely that bargain-hunters will be able to purchase an "almost new" bird at "fire-sale" prices.

The problem arose this way: For several years, Telesat Canada, the monopoly satellite carrier, kept telling broadcasters, cablecasters, government, and anyone else who would listen, that the future was at 12 gigahertz, **not 4 GHz.**

You may remember, that in the olden days, Telesat's engineers would weave a web of tall tales, telling us that terrestrial microwave interference would be so severe in urban areas, that 4 GHz was virtually useless. They also tended to ignore the **fact** that even in the 1970's there were a lot of 4 GHz dishes out there in cities.

Well, you probably know the rest of the story. Telesat lobbied hard to have the Canadian pay-tv companies use 12 GHz and fill up all of that transponder space that Telesat was constructing. For a short while, quite a few transponders were filled, but then the bankruptcies and mergers started occurring (scratch a couple of transponders). Telesat pulled off another coup by leasing some transponders on a 12 GHz bird to a subsidiary of GT&E, who in turn leased the space off to USCI, for their "modified DBS" pay-tv service. Of course this was to be an interim lease, only until USCI obtained transponders on a U.S. domestic satellite. If you are a regular reader of **CSD** and **CSD/2,** you will be familiar with the trials and tribulations of USCI.

Then, to complicate Telesat's marketing schemes, a new Cana-

THE SR-4600P RECEIVER

The SR-4600P is the dual conversion receiver designed for the most demanding applications. Its rock solid stability, 30 MHz IF bandwidth, extended threshold quadrature detector and excellent sensitivity result in brilliant, interference-free pictures — and make it ideal for unattended or commercial applications.

The SR-4600P is supplied with your choice of built-in downconverter or separate dish-mounted downconverter.

Features include: back porch clamped video, AFC and AGC with on/off switch, screwdriver-tuned video and audio with center tune LED's and optional wired remote control.

The performance, features and extremely moderate price make the SR-4600P an unbeatable choice.

Write or call for a spec sheet today.

Dealer and distributor inquiries invited.

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OKLAHOMA CITY, OK 73126
(405) 232-5808

STATE-OF-THE-ART COMMERCIAL RECEIVER FOR $650.*

ICM VIDEO

*Dealer net price.

dian sports channel (TSN) and a music channel (MuchMusic) decided that 4 GHz was much more useful for national distribution, and cost effective as well. Then, the CBC moved its distribution to Anik-D1 and Cancom applied to add WXYZ-TV Detroit (ABC) to its growing list of channels distributed on Anik-D1.

So Telesat faces a real dilemma: It had reserved launch spaces on the Shuttle, at "let's get acquainted prices." It planned to launch its D-2 (6/4) and C-3 (14/12) satellites on missions late in 1984. If it delayed the launches, it loses the bargain prices, and it also loses its position in the flight schedule. You can't pick up the phone and call NASA and request that your payload be put on a flight **next** week.

There is another problem, one which Canadian space officials **aren't** talking about. Look at a map of the orbital slots for C-band and Ku-band. You will notice that Canada has some of the best orbital slots. Canada has fought hard to get those "centre" slots. The Anik birds don't suffer from low look angles (i.e. Galaxy-1 in the eastern part of North America or Galaxy-2 in the west.) Several Latin American nations have been lobbying at the WARC and RARC meetings to "acquire" favorable orbital slots. In fact, several nations argue that the North American domsats are actually positioned over **their** territories; thus **they** should be entitled to the orbital slots.

Some American companies have also thought that the number of orbital slots for America should be increased. At whose expense? There have been a few eyes enviously cast over towards Canada's orbital slots. Some people have suggested "if you can't fill your transponders, why should **you have** the choicest orbital slots?"

Now thus far, the Canadians have formed alliances with some of the Latin American nations at the RARC conferences, and have been able to retain their orbital slots, but you can rest assured that this latest move by Telesat to sell off an entire Ku band bird will not go unnoticed. In the same vein, Telesat launched Anik D-2 in early November. Anik B, (the older hybrid C-band and Ku-band satellite) was still in good shape, with transponder levels which are fantastic for a bird of that vintage. (CBC and "anik-jingle-audio" suspended transmissions on Anik B around 10/25/84). Telesat decided to "park" D-2 in space as a **"spare"** for the next two years, until the fuel supply on Anik B is exhausted, or its main transponders fail. Telesat publicly says that they are launching D-2 **now** to take advantage of the low Space Shuttle launch rates. But you read it first, in Coop's, that Telesat is literally **"staking out their territory in space"** by launching Anik D-2 **now.**

Telesat's annual "satellite user conference" was scheduled for late November. (Unlike SPACE/STTI conferences, Telesat charges several hundred dollars per attendee. There's something to be said for "SPACE/STTI free enterprise"!) In a future edition of **CSD,** we'll have a report, and let you know whether Telesat's marketing people are in touch with reality. They are still fighting that rear-guard action against private ownership of uplinks. They are also still filing comments with the CRTC, which suggest that they have lost a lot of revenue because Cancom has leased off a few audio subcarriers to news and radio networks. Dream on Telesat! By the way, 35% of Telesat's revenues came from uplinking charges. No wonder why they want to retain that monopoly!

The CRTC called for comments to be filed in early November, (for a November 26 hearing), concerning the creation of Canadian "superstations." The CRTC proposes to liberalize the rules concerning satellite and microwave transmission of Canadian television stations, and carriage on cable television (and presumably SMATV). From the tone of the call for comments, it appears that **there will be superstations** unless the CRTC is presented with some persuasive reasons to the contrary.

It is also rumored that the CBC will make its Toronto flagship station CBLT-TV into a "superstation" on Anik **D-1.** The plan would have CBLT-TV distributed via satellite to anyone who wanted to watch the service. This would provide TVRO owners and cable systems with a full-time TV service, rather than network feeds which are often interrupted by news and public affairs feeds.

RANDOM Notes:

Cancom transponders are becoming "loaded" with subcarriers.

CANADA/ continues on page 62

BORESIGHT

ON THE TUBE . . .
2/07

ARE antennas 'overbuilt'? Who pays the price when antennas follow 'old-fashioned' design practices? Is there a better way to design antennas? Find out here! **AND,** Rick Brown defends the SPACE reaction to HBO's latest attempt to put scrambled service into private homes.

Your Industry's Weekly
Video Showcase!

Simple by design.

SIMPLE BY DESIGN. When Anderson Scientific invented the first affordable block downconversion TVRO systems several years ago, our philosophy was, "Make it better by making it simpler." We *have* made it better. We *have* made it simpler.

Simple by design means easier for the dealer to install and easier for the consumer to use.

Simple by design means lower costs with no skimping on quality.

Simple by design means equipment dependability.

BLOCK DOWNCONVERSION. The Anderson block downconversion system distributes all satellite channels simultaneously, enabling independent channel selection on any television set operating within that system. This allows cost sharing of the major expenses of a system (such as antenna and LNA) and provides for individual channel selection between different television sets in a single home or among different houses in a neighborhood. This "*multi-access*" capability enables future "add-ons" by the simple purchase of additional receivers.

THE ANDERSON ADVANTAGE. Anderson Scientific has a history of producing high quality, affordable television reception equipment that spans over a quarter of a century. Much of the broadcast equipment produced by Anderson Scientific has been in continuous operation for over twenty years without the need of a single repair! This is just one example of the Anderson dedication to quality.

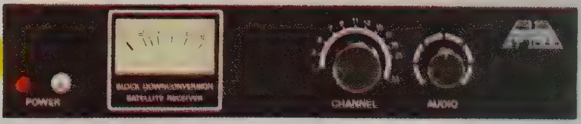
THE ORIGINAL. Anderson Scientific was the originator of the first affordable block downconversion receivers. Our products are so popular that many other companies have made, and are still making, *unsuccessful* attempts to copy them. Patents are pending on Anderson designs. Other companies seeking to enter the block downconversion market are still developing their designs; however, Anderson Scientific can provide you with *already proven*, high quality block downconversion reception.

THE MASTER/SLAVE CONCEPT. Anderson introduced the "*Master/Slave*" concept wherein the main receiver in a house is a deluxe, full-featured "*Master*" receiver (the ST2000); then auxillary, inexpensive receivers (the ST1000) act as "*Slaves*" to provide individual channel selection in other rooms of a home.

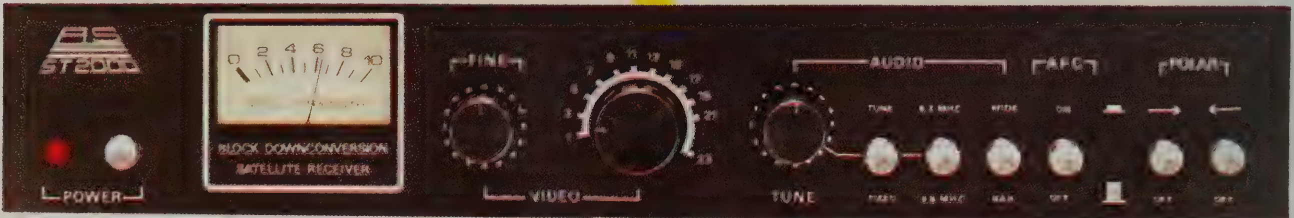
COMPLETE LINE OF ACCESSORIES. Anderson systems are designed to operate in the 440 to 940 MHz band. This permits *already proven* UHF technology and accessories to be used in the systems. Anderson Scientific sells a complete line of accessories that includes every item necessary to take full advantage of the benefits of block downconversion.

ANDERSON
SCIENTIFIC
2693 Commerce, Rapid City, SD 57702 605/341-3781

ST2000 MASTER RECEIVER FEATURES: *Built-in modulator, tunable audio, signal strength meter, audio and video outputs, wide-range AGC, selectable AFC, self-seeking audio, video fine tune, fixed selectable 6.8 and 6.2 MHz audio, an audio subcarrier output (stereo processor may be added for full audio enjoyment), wide/narrow audio, built-in Polarotor II® control, 17-volt LNA power, dual conversion, cool long-life circuitry, patents pending, one year warranty—parts and labor.* ***Made in U.S.A.***▼



▲***ST1000 SLAVE RECEIVER FEATURES:*** *Easy to operate controls, built-in modulator, tunable audio, signal strength meter, audio and video outputs, wide-range AGC, built-in AFC, self-seeking audio, 17-volt LNA power, dual conversion, cool long-life circuitry, patents pending, one year warranty—parts and labor.* ***Made in U.S.A.***



Anderson Master/Slave System

ODOM.
The one the others copy.

Some enterprising people out there have found that it's a cinch to make an antenna that LOOKS LIKE an Odom.

You simply buy an Odom antenna and copy its shape. To save more time and money, you stamp it out with a press.

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On Transponder 8, you will find subcarriers at 5.5, 5.7, 5.8, 7.2 and 7.8. We noted the CHUM radio network news transmission on 5.7 and audio tones on 7.3. On transponder 12 noted subcarriers on 7.4 and 7.5 MHz.

On transponder 20, a radio news network feed on 7.75. On transponder 24 we noted VOCM. This is an AM station from St. John's, Nfld. The station was on the air prior to Newfoundland joining Canada in Confederation. That meant the station had the unique "V" call-letters prior to 1948, and is one of the few remaining "V" stations. We also noted data transmissions on transponder 20 at 6.4 MHz. You may also note the presence of CBC FM (mainly classical music in discrete stereo) on the transponders occupied by the House of Commons.

TRANSPONDER WATCH

RECENT REPORTS OF ACTIVITY ON DOMESTIC / INTERNATIONAL SATELLITES

Send your reports to CSD Transponder Watch, P.O. Box 100858, Ft. Lauderdale, FL 33310. For late news, call (305) 771-0505.

CABLE programmers starting to focus on how they will sell their satellite services to home TVROs with multiple 'plans' under consideration. Dollar amount ranges between $20 and $25 for 'bundled package' of pay plus basic services, all to be scrambled on Galaxy 1.

ALTHOUGH Comsat has pulled out of DBS, it continues with construction (thru RCA) for twin birds scheduled still for delivery December 1985 and April 1986. Comsat still retains launch dates of March 6 and June 25 (1986) for birds. One possibility is that Comsat may sell birds with launch dates.

ECUADOR and France (acting on behalf of Caribbean 'properties') up in arms with US for what they claim is US 'failure to coordinate with them' prior to establishing US domestic satellite allocations in Clarke Orbit Belt. Both are concerned that 'satellite spillover' from US domestic satellites is reaching 'their territory' and that US had not 'checked with them' prior to allowing such satellites to operate. There is a policy, through Intelsat, which is supposed to require such advanced 'coordination;' Ecuador and France are 'miffed' that US domsat signals are reaching their territory and US, they claim, is not checking with them.

ISN, the new low power TV station service on Galaxy 2, TR15, is being uplinked from Ocala, Florida via Central Florida Teleport.

LATE January Shuttle flight was scheduled to launch special $300M 'eaves-dropper satellite' for US Department of Defense. Bird has complex microwave/ SHF receivers on board allowing reception

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of multiple Russian internal services including satellite services, for relay back to US receiving sites.

EUROPEAN governments and established broadcasting 'agencies' of those governments continue to battle the proposed Luxembourg 'Coronet' plan to allow 16 transponders of Ku band service on a 'free-for-all' service basis. Latest argument thrown up; such a satellite would 'chew up' an estimated 250,000 hours of original programming per year whereas calculations show at present European terrestrial TV only creates around 2,500 hours per year total (non-news and non-sports programming). Attitude is 'why license such a structure' if programming for it does not exist?

SHOWTIME/The Movie Channel 'claim' they have been systematically acquiring 'DBS rights' to those movies they rent from Hollywood but Showtime's Neil Austrian suggests his firm is 'not yet convinced of the viability of backyard DBS.'

TEN of 14 Ku band services currently available in Europe remain unscrambled and apparently have no hard plans to encode uplinks in near future. TEN (movie service), Screen Sport, PaySat, RAI (Italy), Music Box (MTV), Premiere (movie service), Euro-TV, FilmNet (movie service) remain in the free to watch category.

SEVEN women in the TVRO industry have been elected to serve on the organizing 'Board' for Women In Satellite Communications (WSC). They are : **Connie Willet-Everett** (Satellite Reception Systems), **Kathy Lewis** (Lewis Electronics), **Shirley Ware** (NASEM), **Barbara Clendenin** (Solar Satellite), **Nancy Turpin-Sherwood** (Odom Antennas), **Robyn Nietert** (Brown and Finn Chartered) and **Lynda Carter** (Satellite TV Magazine).

EUROPEAN studies suggest that peak years for launch of new communication satellites will be 1989 to 1991. Europeans see 'primitive' launch vehicles (Shuttle, Ariane) phasing out in the late 1990's with advanced (reusable) 'SPACE Planes' the next wave of launch vehicles beginning as early as 1997.

ARIANE launch schedule for 1985, subject to minor slippage to accommodate final satellite preparations, as follows: (early) February/ SBTS 1 and Arabsat; April/ G-STAR 1B and SPACENET 3; July/ GITTO; August/ (French) Telecom 1B and SBTS2; September/ Intelsat V (F13); November/ Spot-Viking.

CANADIAN Cancom US service roster finally filled with addition of ABC Detroit affiliate WXYZ completing the NBC/CBS/PBS + ABC package. Latest CANCOM 'worry' is possible loosening of Canadian regulatory strings allowing additional US services to be carried by Canadian birds in future.

HUGHES DBS bird, scheduled for launch late in 80s, will probably be a 'condo' package, selling off individual transponders or groups of transponders to users. This was approach originally created for Galaxy 1 where Hughes created satellite and then sold out 'units' (i.e. transponders) under contract. Under this arrangement, Hughes operated 'bus' but takes on 'passengers' who are willing to pay the 'rent,' Hughes wants its first DBS (12 GHz) bird to be at 101 west with 32 separate transponders/channels available on two side-by-side birds.

SPRINT, GTE message service, is currently using 8 (of 24) transponders on SPACENET 1 bird and 15 (of 24) on more recently launched SPACENET 2 bird.

HOWARD JOHNSON MOTOR LODGES is latest of major hotel operators to make a decision for satellite service. HJ plans around 470 receive-only terminals, of which 350 will be at franchise locations. Services to be carried will include WGN, The Playboy Channel, Country Music Television, ESPN, and The Movie Channel. Yes, that **is** four bird's worth.

EUROPEAN strategists showing new interest in 'Molniya-Like' orbits for communications into northern reaches of countries. Molniya has highly inclined orbit (see **CSD** for November 1984 and before) allowing coverage to (and beyond) polar regions. Television not object; low power two-way radio or radio-telephone suggested for remote villages and 'travelers' as well as maritime interests plying more northern routes.

SPACE/NASEM standards committee questionnaire studies now being completed by OEMs; first phase of providing input to industry committees studying best ways to police, internally, equipment specifications and establishing of minimum performance standards.

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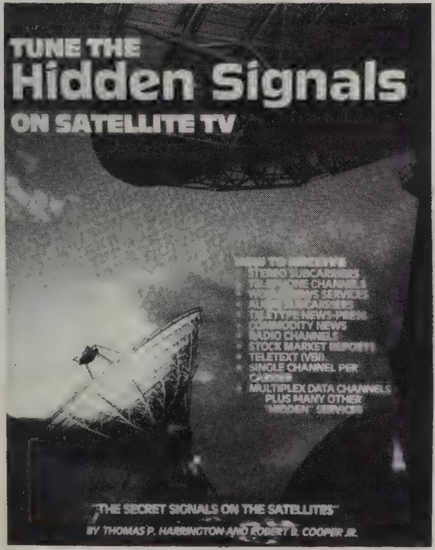
"THE SECRET SIGNALS ON THE BIRDS"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U.S. Army spent $350,000,000 on 'space communication systems' during 1984 fiscal year.

ARABSAT bird number 1, scheduled for launch days after **CSD** goes into mails, will be stationed at 19 east. If launch goes properly, bird should be on station by mid-February and testing of communications links around February 20. Seven transponders have been set aside for television relay plus 2.5 GHz ('S band') channel for telecasting to 'remote villages.' There are 22 Arabic nations sharing in the cost of the $200M system.

INCREASED business competition from Intersputnik, the Russian (Gorizont) equivalent to Intelsat, is forecast by space economists who spend time studying Russian efforts in this area. Most Intersputnik equipped countries are in Russian 'block' but new terminals planned for Nicaragua, South Yemen, Cambodia, Libya, Angola, Mozambique and even Sri Lanka have attracted considerable political as well as technology interest. Meanwhile, Russian television programming on Gorizont at 14 west has increased with greater emphasis on **non**-Russian uplink sources such as Italy, Austria and others in recent weeks.

ST. LOUIS Cardinals (football team) managed to get Federal Court to issue order shutting down five clubs/bars in St. Louis area who were 'pirating' Cardinal football games directly off of satellite feeds. Cards also wanted judge to rule against bars using tall, sensitive VHF and UHF fringe area antennas to bring in same 'blacked out games' from distant terrestrial stations but judge denied request.

COMSAT decision to back out of DBS world having ripple effects; a group of potential DBS operators trying to form industry standards committee to eliminate mixed video and audio standards (and simplify receiver system design) skipped scheduled December meeting to give would-be industry time to assess Comsat pull-back. Future of US DBS, much before late years of this decade, now in grave doubt.

FORMER Astronaut Gene Cernan, a member of Intersat's Board or Directors, has allied himself with space insurance and risk management firm Alexander and Alexander. A&A were involved in covering the Westar 6 loss one year ago.

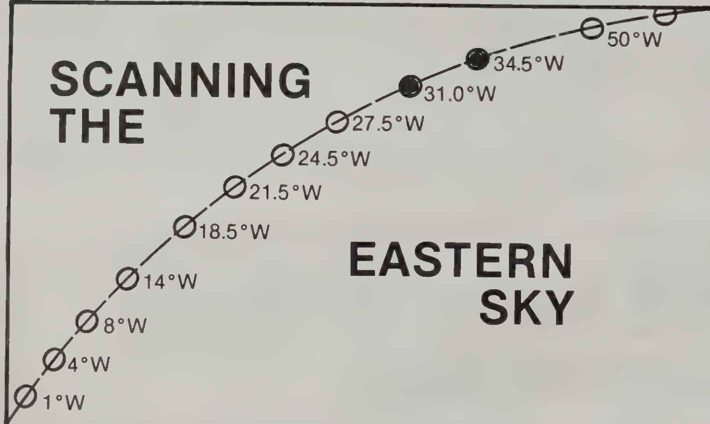
C-SPAN hopes to raise $1,000,000 this year from private sources and foundations to up its annual budget to $6.7M. Primary funding for the popular service comes from the cable TV industry.

TICKER TAPE displays of real-time New York Stock Exchange activity at 4,000 potential locations may become satellite fed instead of land-line fed. Equatorial Communications, using TR18 F3R spread spectrum and Westar 4 spread spectrum format will shortly be offering this service under new agreement with exchange.

FINANCIAL community impressed with overall activities of M/A-COM, raising their rating of its stock and debenture 'value' in money marketplace. Uncertainty concerning firm's involvement in scrambling activities not taken into 'direct consideration.'

SCN out of Nashville will be using 36 MHz of SPACENET 1 TR17 to link info-educational programming to hotels owned by (Nashville headquartered) Hospital Corporation of America. Only 11 of the 408 HCA operations presently have TVROs; more plan them in 1985 but each HCA hotel will make its own 'buy decision.'

SCANNING THE EASTERN SKY



by MARSHALL FOILES, CSD LAB, PROVO

Continuing our look at the birds in the eastern sky, we concentrate this month on the services **visible in the western hemisphere** from 34.5 and 31 west.

The 34.5 west bird is a newer series Intelsat V although it was one of the first V series birds to be launched. This bird has capabilities far greater than its use for the western hemisphere and is in fact more heavily utilized for the 'eastern' beams than the western beams.

Routine video seen **west** of the satellite's location boils down to Global beam feeds found on TRs 22 and 24. The TR22 service is typically run in the half-transponder format and is used by various international clients on a scheduled or non-scheduled basis. The most prominent service seen routinely is a French TDF news feed at 1400 GMT (9 AM eastern) daily. This feed typically lasts from 18 to 22 minutes and is a 'DEF' type feed intended for use by remote French speaking lands. The feed originates in Paris and uses a standard sub-carrier. In the 'Global' configuration, typical footprint levels are around 19 dBw. A 20 foot dish provides usable but certainly not high quality video.

TR24 is used in both half and full transponder format, often by NBC around mid-day to 3 PM (eastern) to ship European and middle-eastern news film footage back to New York for possible use in the NBC Nightly News. However, such feeds are generally brief (15 minutes or less) and for the majority of the day this transponder is (like 22) not occupied. This is an excellent transponder to check for inward bound news feeds from Europe in the event of a newsworthy event from east of the Atlantic.

Other services noted on 34.5 west include:

1) **TR5**/ Telephone traffic, lower sideband, spread throughout the transponder;
2) **TR8**/ Telephone traffic, lower sideband, starting around 1.182 MHz on a general coverage receiver designed for tuning in communications traffic.
3) **TR12**/ SCPC carrier (one) near the middle of the transponder (no modulation, apparently 60 KHz wide FM).
4) **TR16**/ SCPC carrier (one) near the top of the transponder (no modulation, apparently 60 KHz wide FM).

Towards **the east**, the 34.5 Intelsat V bird provides half transponder video on TRs 9 and 10 for Spain with audio on a 6.6 MHz subcarrier. These services cannot be seen 'west' of the bird's location.

The 31.0 west bird **has been** the 'heavily loaded' South American domestic video lease bird for more than a year. This has been an Intelsat IV-A bird, the oldest of that bird series. There have been recent changes and some of the popular video service found here previously is now located on Intelsat V at 27.5 west.

The only two video services presently found on 31 west are Argentina's ATC (TR24) and Colombia's Intravision found on TR1. Argentina carries audio on a standard sub-carrier (6.4 MHz) while Colombia sticks its audio upon an SCPC channel about mid-way into TR9 on this same bird. Of the two, the Argentine 'ATC' coverage is most readily available to dishes in the 16 feet and up class along the eastern belt of North America. The Intravision service (half transponder) is at best 'noisy' on a 20 footer. The audio, on TR9, is even more

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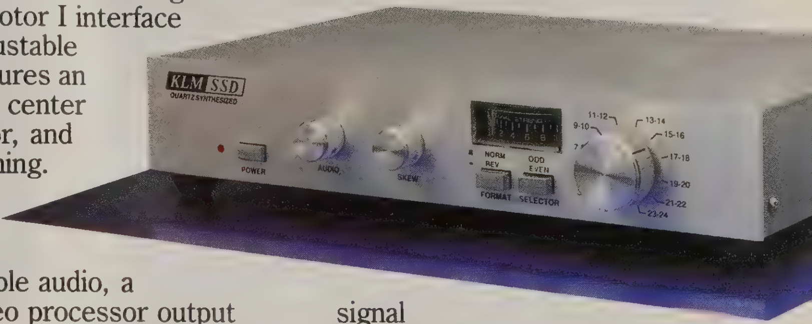

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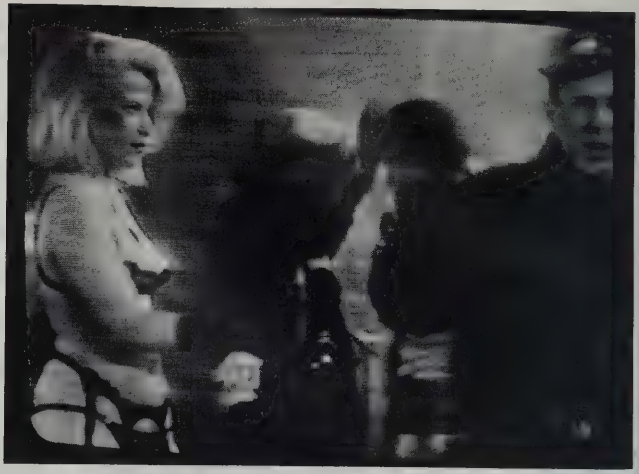


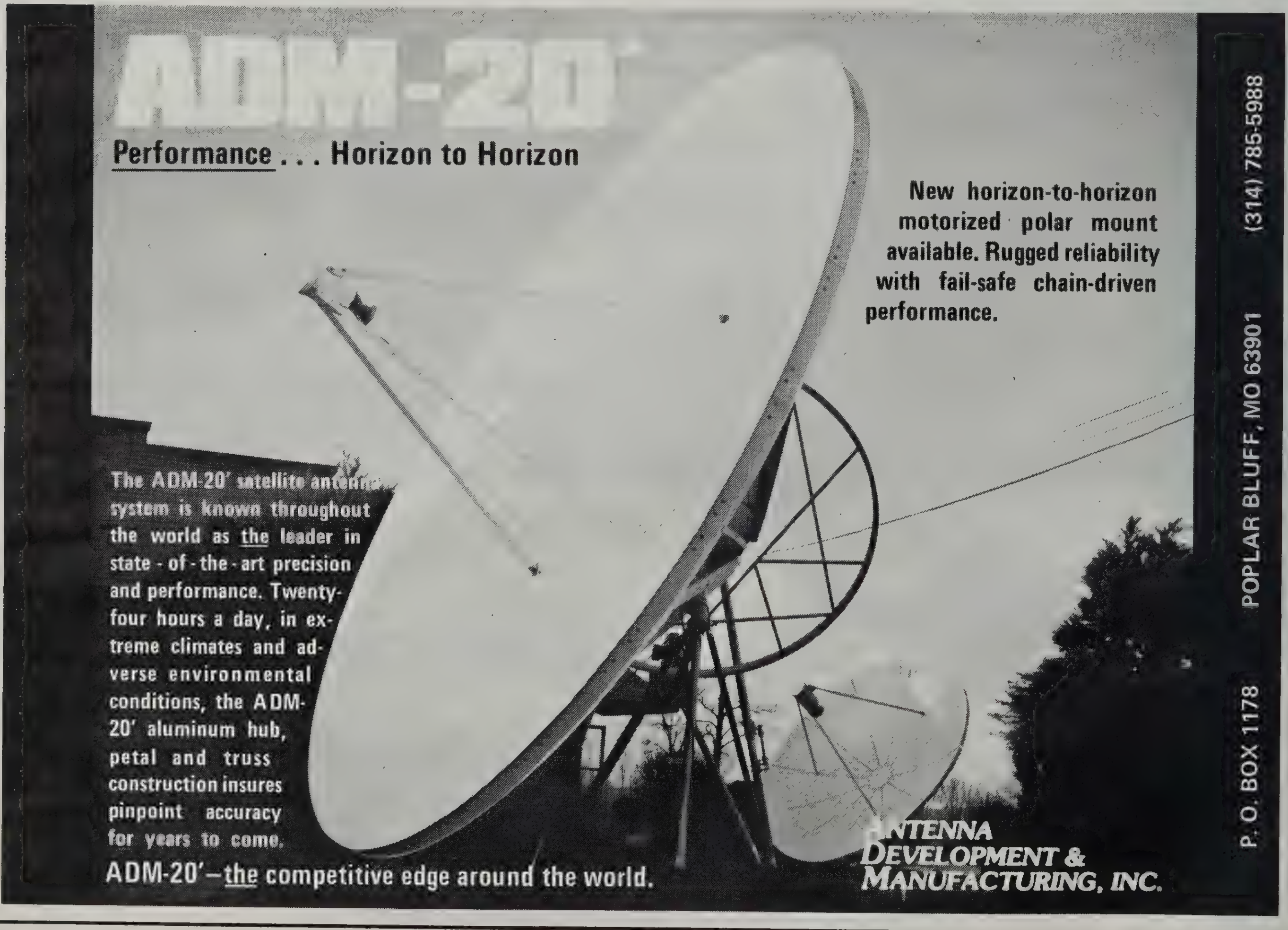
WEST GERMAN MUSIC VIDEOS continue to be heavily featured on Gorizont. They go 'further' **than TV censors will allow.**

difficult to resolve 'cleanly.'

(Those who have 'missed' **Venezuela** and **Peru,** previously found on this bird, will find them respectively on TR5 and TR3 for Intelsat V at **27.5** west. We'll look at 27.5 west in our next installment.)

Telephone (SCPC FM) is found scattered throughout the bird with particular clusters on TR19 (mid and low end), TR21 (low end) and TR22 (extreme low end).

Argentine television operates using a modification of the European PAL format; you can recover perfectly acceptable black and white video on an NTSC receiver (adjust vertical hold to stop roll) or on a PAL receiver (no vertical adjustment required). Color is elusive unless you have the proper monitor to suit their 'unique' format. The Argentine signal is a full transponder, global format and perhaps the most outstanding full transponder, global footprint signal operating in the world today. Their production qualities are good and recently they have been leaning heavily on an increased amount of (dubbed to



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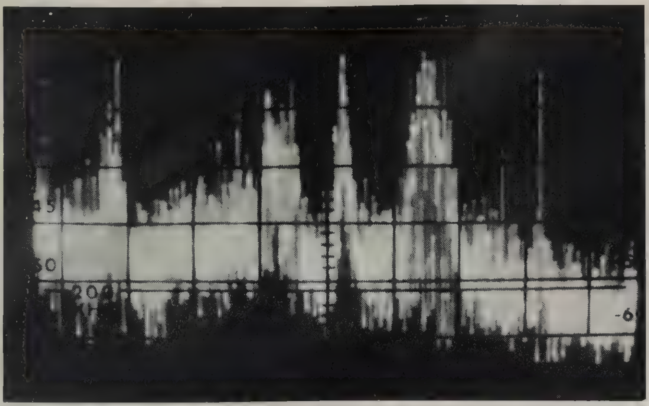


RECENT Gorizont spectrum display; left to right Moskva 1 – video, **normal** TR1 **not 'up' at time,** TR4 **SCPC/data,** TR6 **video,** TR9 **digital and** TR11 **SCPC test carrier** (far right).

Spanish) American television fare; such as 'Dukes of Hazzard,' 'Whiz Kids,' and movies such as 'The French Connection.' News coverage is 'sparse' but some excellent footage of neighboring Chile's problems with civil unrest has been prominently featured.

Both birds represent typical Intelsat 'overkill,' maintaining considerably greater 'capacity' than is used even in 'peak periods.'

Russian Update

In mid-January there had been a number of format and operational changes apparent with the Russian Gorizont bird located at **14 west.** The Gorizont birds have always been capable of **six transponder** operation although it has been some time since more than three or at most four have been active. The six include **TR1** – (18 hour per day television relay internal to Russia; so-called 'Moskva Service') found just **below** our standard TR1 (3675 MHz), **TR1(+)** which recently has been used heavily for television programming, **TR4(–)** which carries a considerable number of scrambled and non-scrambled audio and data services (see **CSD** for November 1984; **page 47**), **TR6** which is also heavily used for television programming, **TR9** which once was 'the' television service channel but which since September 1 has been used for digitally processed data, and finally **TR11(–)** which until the first of December was not in service at all.

TR1 (+) has recently become more 'Russian' video oriented with interesting newscasts, weather forecasts and other 'Russian internal news' around 12 noon and 1 PM weekdays (eastern time). **TR6,** at the same time, has become more 'international' oriented with a heavy amount of Italian television programming either in Italian or 'over' dubbed in German. East German television from DDR 1, often seen between 4 PM and 6 PM (typical close-down) eastern time has become more routine although often the East German feed is an Italian program over-dubbed with German. Saturday afternoons (eastern time) frequently have American movies (example: '**Earthquake**') in their original English, but over-dubbed in either Russian or German on TRs 1 and 6.

The December 1st test-activation of **TR11(–)** suggests some new service may appear here before this is in print. Both video test patterns and SCPC carrier signals have been noted, at levels equal to the best of TRs 1 or 6 in the western hemisphere as this is written. The transponder had been noted 'turned on' for about a week prior to the appearance of the first 'test signals'; the 'noise floor' created by an operating transponder (not receiving an uplink signal) was apparent on a spectrum analyzer prior to any test signals.

COOP/ continued from page 5

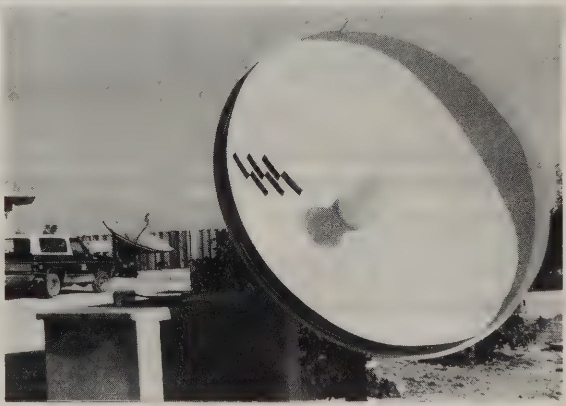
in Ohio for the same wage scale they pay in Taipei so you have to be smarter if you can't be cheaper.

From my visit at Luxor where I saw 1,500 people doing more work than 3,000 people did in the same plant back in 1979, I have to agree that automation in assembly and testing is the only way to fly in 1985. A small Far Eastern firm can substitute girls at $.30 an hour for

BORESIGHT

ON THE TUBE . . .
2/14

IS SPACE going to give away its strategy in dealing with HBO, in advance? Rick Brown says 'no-way' and discusses compromise and negotiations, here. Lightweight TVRO antennas may be an important part of 1985 system sales; you be the judge.



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automation but those girls can't compete with automatic parts inserters and waveflow soldering machines and computer run test stations. Not for long.

Luxor has shown that you can squeeze as much as 70% of the labor cost out of a printed circuit board product by automating everything in sight. The Japanese routinely run entire production plants turning out thousands of identical products per day with as few as 5 people (!). Everything is automated, everything is computer controlled right down to packing the tidy carton. **And that** is the wave of the future.

Our January 15th **CSD/2** industry survey reported that the biggest profit squeeze was going to come at the distributor level. There seemed to be an agreement that there are far too many middlemen distributors in the field, although it is my opinion that a guy who stocks $20,000 in equipment in a backroom is hardly a distributor. If the successful OEMs continue to chip away at their costs, like Luxor and Drake, and the dealer sits at the end of the line demanding lower and lower prices (as well as better and better quality), the guy in the middle seems mostly likely to be hurt. Yes, it will be a tough year for many distributors and undoubtedly those who stick it out will find innovative, new ways to hold onto dealer allegiance. **Echosphere,** for example, recently announced that through General Electric Credit Corporation (GECC) they are offering floor plan financing for those dealers (who qualify) with $20,000 average monthly purchases and up. At the wholesale level, that means a guy with 12 or so system packages moved per month can gain perhaps 30 or 45 days 'cash flow' advantage by buying from Echosphere. Others will have to follow, or run the risk of dealing only with those dealers who cannot qualify for GECC type financial requirements.

One of the hang-your-hat-on-it numbers to come out of the January 15th **CSD/2** report was a decent fix on the 'size' of our industry. We reported, after working at the answer from two unrelated directions, that the industry managed to stick between 427,740 and 457,407 terminals in the ground during 1984. Those new terminals came on top of those already in the ground on December 31, 1983 and it appeared to us that we hit just over the three-quarters of a million mark on December 31st (750,041). We also were able to forecast when the **1,000,000th TVRO** would be installed (around 3:03 PM eastern time on May 29th of this spring).

I've talked at some length with SPACE Chairman **Taylor Howard** about numbers. Taylor has a direct 'pipeline' to the monthly shipment numbers for the Chaparral feeds and while he has never given me his permission to report those numbers to you, suffice to say that his Chaparral feed numbers always seem to come out greater than the 'best estimates' of the industry as a whole for the size of the industry THAT month. He and I have come to a pair of semi-reasoned conclusions:

1) Chaparral, because it sells a high percentage of its feeds to antenna OEMs so they can pack the feeds with the antennas, is actually selling 30 to 60 days **in-advance-of** the 'real numbers'; that is, a Chaparral feed shipped in February will probably be mated with a brand XYZ antenna that is shipped in March or April.

2) Somebody has shelf after shelf filled with Chaparral feeds. Not in use Chaparral feeds. Maybe this is because dealers may order the XYZ antenna which automatically comes with a Chaparral feed, and then they substitute an Omni or some other feed for personal preference. If this is the case, thousands of dealers have tens of Chaparral feeds stashed away!

In our own case, most of the antennas we receive do come equipped with a Chaparral feed. Even some of the receivers we receive come equipped with a Chaparral feed. So we do, indeed, end up with a warehouse of Chaparral feeds. Eventually we use them because our test lab in the Caribbean chews up feeds at a rapid rate and we lose more than our share of everything to the ingress of moisture and bugs and blowing sand. But we are not typical.

What was typical was the industry's own rating of which firms will make it through 1985 with business success. Chaparral, to nobody's surprise, rated highly here with our surveyed people. They were right behind Uniden (the 'most likely to succeed,' with the OEMs and distributors 'voting') and tied with Drake for number one with the dealers surveyed. For those, primarily overseas, who do not receive

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CSD/2, I will repeat the 'top ten ranked' firms with both the OEM/Distributor voters, and, the dealer voters.

With OEMs/ Distributors	Rank	With The Dealers
Uniden	1	Drake, Chaparral (tie)
Chaparral	2	**(see above)**
Raydx	3	Houston Tracker
M/A-Com (antennas)	4	Uniden
DX	5	M/A-Com, DX (tie)
Winegard, M/A-Com (electronics)/tie	6	**(see above)**
(see above)	7	Winegard, Avantek
Channel Master	8	**(see above)**
Houston Tracker	9	Intersat, Paraclipse, California Amplifier, Norsat (tie)
Avantek	10	**(see above)**

The January 15th **CSD/2** 'rated' chances of 1985 success, based upon the hundreds of survey forms completed by and for CSD, for more than 60 firms. If there are any real 'surprises' in the 'top ten,' **DX** would be high on the surprise-list. Their volume, to date, has not been high primarily because they have been concentrating on the SMATV end of the marketplace with their model 642 receiver. Their entry into the full-blown private world, with their newer model(s), has apparently impressed many people; at both the OEM/distributor **and** the dealer levels.

The only other 'surprise' we will dwell on is that Drake **did not make it** into the top ten (they were number 11) with the OEM/distributor group. This tells us that while Peter Drake and crew may be confident that they can compete effectively with Far Eastern imports during 1985, their OEM competitors and the distributors are not quite so sure. It will be interesting to revisit this one year from now.

ANOTHER Year

In our January 15th edition of **CSD/2,** we reported the results of an intensive set of industry studies relating to the future of this industry in 1985. I felt comfortable with much of what those studies revealed, and was genuinely surprised to see such excellent correlation of data between such seemingly diverse groups as dealers and OEMs.

Several readings of this material, later, I do have a few observations however. I'm not sure we have focused on all of the finer points of 1985 as well as we could have.

1) **Test equipment.** With the limited exception of the Newton model 2600 and 1600 test boxes, we have virtually no specialized medium to high grade test equipment in our industry. And that's a shame.

We need somebody to sit down and design an entire fleet of TVRO related test equipment. I blame part of the shoddy dealer workmanship that occurs all too often on a lack of test equipment. We are expecting people who sold shoes or assembled chain link fences **last week** to do an acceptable job installing 4 Gig microwave hardware **this week.** And we expect these installers to be bright enough to understand everything from moisture ingress to elevation angle offset, all in the first month.

Jeff Smiley and crew at Northwest SatLabs started the test equipment business with a 'Tweaker Meter,' an advanced field or signal level meter which gave the installer a tool to determine when he had his antenna peaked and tracking. I am still surprised by the number of installers who 'eyeball' a TV set and walk away from the job never **verifying** anything with metering. **Taylor Howard** and friends created the Newton test sets several years ago and I am disturbed that most of their customer have been OEMs. I can't throw too many stones; our **CSD Lab** only acquired its first Newton test set this past fall, and then we promptly got another one. And wondered how we ever got along without it. (We look at the Newton units in this issue, by the way.)

That's it. **We still have no way** to properly verify modulation percentages on our modulators (aural or visual). We have no way to check out a 400/900 BDC IF line (a CATV field strength meter is NOT the answer!), not to speak of the 900/1400 or 1140/1640 MHz IF lines. I have asked several people to design us a spectrum analyzer downconverter which allows us to downconvert the 400/900 and 900/1400 (950/1450) MHz IFs to a range which can be seen on a reasonable

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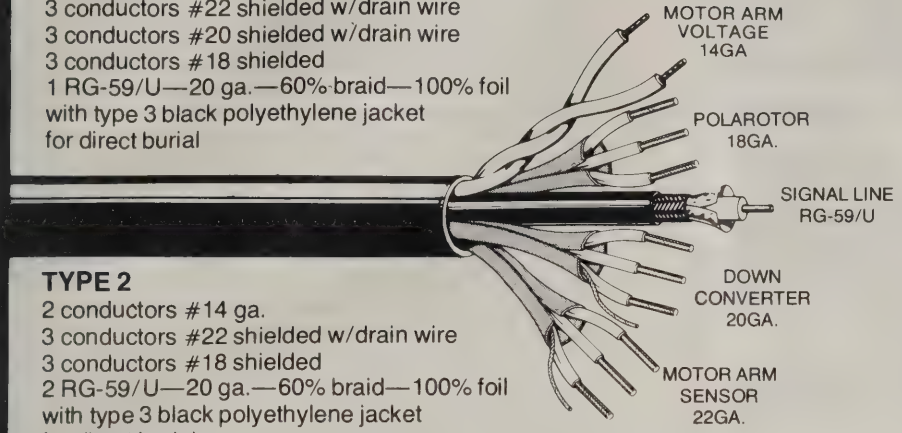

TYPE 2
2 conductors #14 ga.
3 conductors #22 shielded w/drain wire
3 conductors #18 shielded
2 RG-59/U—20 ga.—60% braid—100% foil
with type 3 black polyethylene jacket
for direct burial

TYPE 3
2 conductors #12 ga.
3 conductors #22 shielded w/drain
3 conductors #20 shielded w/drain wire
3 conductors #18 shielded
1 RG-6/U—18 ga.—60% braid—100% foil
with type 3 black polyethylene jacket
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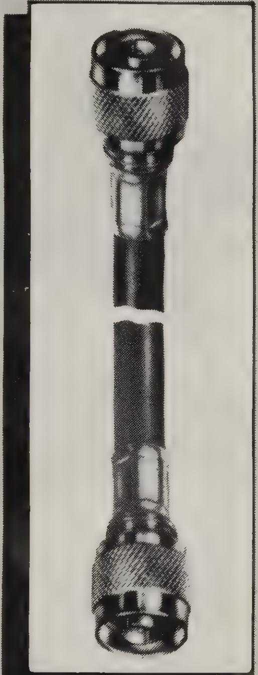

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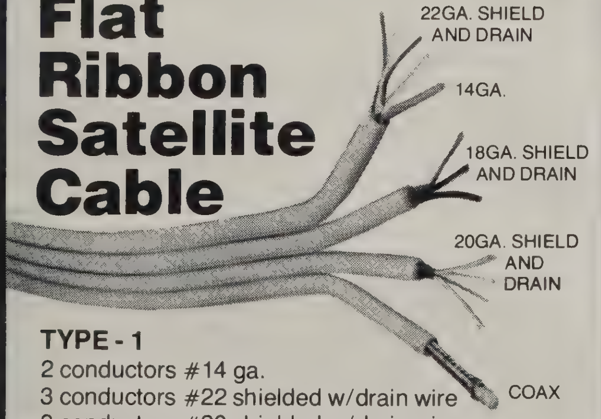

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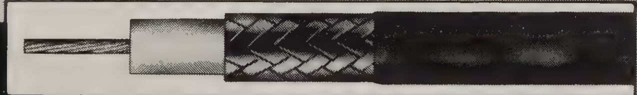
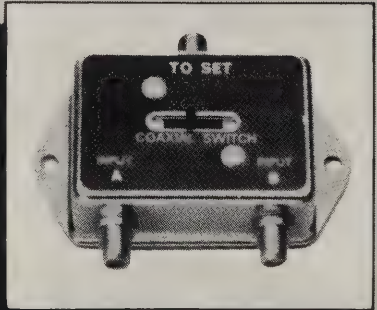
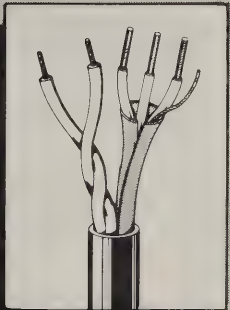
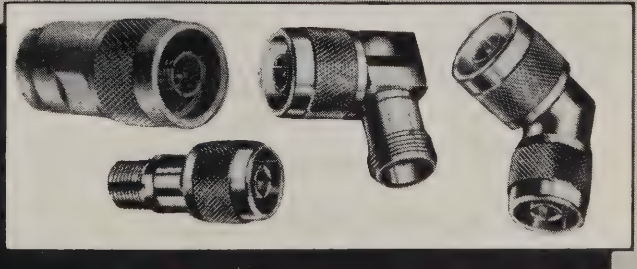
3 conductors #20 shielded w/drain wire
2 conductors #18 shielded w/drain wire
1 RG-59/U—20 ga.—95% copper braid

TYPE - 2
2 conductor #14 ga.
2 conductor #20 shielded w/drain wire
2 conductor #18 shielded w/drain wire
1-RG-59/U—20 ga.—95% copper braid
1-RG-6/U—18 ga.—95% copper braid









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priced CATV grade analyzer. It is a wonder to me that even half of the BDC systems 'fly' when hooked up given all of the problems you can (and will) have with fittings and splitters and even cable in the higher ranges. Where do you start in resolving a 'suck out' or loss of frequency range in a cabled BDC distribution system? Without test equipment, you simply replace a component at a time, with a new one, hoping that eventually you **will** find the bad part.

If you are into doing SMATV headends, using Pico or other low priced modulators, you know the frustration that comes when you have to try to set the video and audio modulation levels without any test equipment. First you tune in a local TV channel direct, note how 'loud' it is in the speaker and how 'vivid' the color is on the screen, and then you swap back to the SMATV modulator channel and try to duplicate the two. If you come within 3 dB, you are doing well with the audio and the video defies accurate setting since scene content so dramatically affects the picture quality. Boy would it be great to have a 4 or 5 inch TV screen which gave you a color display from an internal set of color bars and a 0 dBm audio tone as a reference; and then as you dialed through the channels it 'read out' on the screen for you, in analog fashion with a bar or line, the percentage of peak video and audio modulation! **I'd buy one, or two, instantly.** And get double duty out of the unit because it would be 12VDC operated and capable of direct video/audio (monitor connection) as well as VHF/UHF channel display.

To be able to use our Texscan 0/1,000 MHz VSM series analyzer to check levels (and losses) in a 900/1400 (or better yet, 900-1,800 MHz to catch the Winegard 'custom' high IF as well) system would be a big work saver. I have a box filled with line splitters and terminators and 'F' fittings which proved unsatisfactory above 1,000 MHz (you would be amazed at how critical the lowly 'F' fitting, for example, becomes when pushed above 1 GHz). There is a lot of work to be done in this region and as the industry marches headlong into 950/1450 MHz distribution systems, you would think that somebody would be bright enough to realize how badly test equipment is needed here. We'll see.

If I were thinking about entering the TVRO world today, with a new product or line of products, the most fertile new area I could find would be test equipment and system verification equipment. Test sets to check for TI are nice, and needed; but even more important is the requirement for equipment which focuses on the cable distribution we do of the satellite signals after they start their trek from antenna to receiver. We'll know we have arrived when somebody tackles this one.

OUR Testing Facility

For almost as long as there has been a **CSD** (and therefore an industry), we have been 'testing' and 'evaluating' pieces of equipment and writing about our test results. I venture that in the five years plus, we've tested more than 100 units of one type or another.

During the last year or so I have been increasingly uneasy with the way we test things. The only thing I could see that we were doing differently than others was to put our 9 years of TVRO experience on the line against lesser years from other reviewers. Something more 'qualitative' was required; something we could hang our hat on, use as a reference, and go back to as the need arose.

So I put our **Marshall Foiles** busy on a project to make equipment testing and verification more of a solid thing here. I wanted a REAL 'Lab' for **CSD,** not just a handy corner in the WIV-TV facility. The first thing Marshall did was wire the place so that we could instantly plug in a TV camera and a microphone whenever we are doing testing. We wired every testing area in the facility back to the master control room and fed them into a switcher input; we can be testing antennas on the 'test stand' for example and within minutes a camera is piping the efforts back into the control room where 3/4" tape is rolling to record the tests. Then we doubled our monthly purchases of 3/4" 60 minute tape blanks and prepared to start logging.

Recording tests is handy but it does not improve the testing itself. So next Marshall set out to install reference standards for comparison. Each of the testing areas now has reference video (NTSC bars) and audio (1 kHz tone at 0 dBm) available; just throw a switch. In one area where Marshall evaluates LNAs and downconverters, we cycle the equipment on and off at 60 second intervals for 24 hours after performing preliminary testing. If the equipment survives that exercise, then we get serious about testing (a McCullough downconverter, written up last month, originally did not make it through this elementary test). Then we got with **John Ramsey** at Sat-Tec and rounded up some 4 GHz rated step attenuators; pads with a switch. Using the Newton 2600 test set as a reference signal, we routinely couple into the mouth of an LNA at 4 GHz through a waveguide to coax transition (used backwards since the 2600 starts out at coax) and with step attenuators in the line, **we determine the threshold for LNAs.** And downconverters. In the best way we can, we reference all of this back to some reasonably stable 'standards' by using a couple of **G1 signals** as reference standards to calibrate the step attenuators and other equipment.

Creating standards, measurement standards for identical tests repeated over long periods of time, is an important first step to knowing what you are doing and how well you are doing it. Getting equipment is another matter.

There has never been a shortage of equipment to test here; we are backlogged several months for **CSD** at the present time but if the patterns of the past hold, only about 60% of what we take in for test will work well enough to be worth writing about. So what about that portion that does not make the test-grade?

Readers continually tell me that we **should write** about **everything** we test; **including** those that fail. I'd agree except that we often agree in advance with suppliers that we will test **first,** talk about the test results **second,** and then decide whether to write about the results **third.** That may seem unfair to readers but it is fair to OEMs. One way around this is to simply bypass he OEMs and acquire equipment in the open market for testing. **Consumer Reports** does this, effectively. I don't have a budget as large as theirs and so cannot compete in their environment. But there is an exception to this rule; when we receive an 'unusual' amount of mail from dealers complaining about a specific unit or piece of equipment, we forget the budget and go out and acquire one. I did this with a pair of **Janeil** BDC receivers last summer and guess what happened; of the two acquired from a major distributor, the receiver didn't work with one (power supply problem) and the downconverter didn't work with the other. That seemed to fit the pattern we were hearing from dealers. So to be 'fair' to Janeil we packaged up the bad **receiver** and the bad **downconverter** and returned them to the (major) distributor they came from. Nine weeks and 5 days later we got the pair back, through the distributor. The units had gone to the Janeil-whatever-depot, had been checked out and repaired (well, at least both functioned when returned) and returned to the distributor who then finally returned them to us. Nine weeks and 5 days.

In the interim the clever people at Janeil had decided **not to manufacture** this particular receiver anymore and they took it off the market by announcing a replacement unit (to be made in Taiwan). So here we were with money invested in a pair of units they no longer made, finally able to test and then write about our test results, and the unit is 'history;' no longer being 'pushed' to dealers anyhow. What would we have written if we had been able to report on the units while they were still 'current production'? Nothing complimentary.

The point through all of this is that we recognize the dealer, at the end of the distribution chain, is constantly fighting a battle with equipment problems. We don't immediately accept dealer statements that this or that is 'bad;' the average dealer is not equipped to do more than plug in units and turn them on anyhow **(I said average!)** and often the problem is a cockpit error rather than an equipment malfunction. We have our own share of that as well. A receiver manufacturer, sending down a downconverter and receiver recently, assured me there was **no way** to 'blow anything up' by accidentally reversing the two pieces of 59 cable which connected the downconverter to the receiver. I told this to Marshall so he was less than careful in connecting the two ends up since he figured if he didn't have pictures between the outdoor antenna site and the inside test location, all he had to do was to reverse the cables inside. Yup, **he blew up the downconverter.** We taught the OEM something here because **we found a situation** where you **could blow up** the downconverter (the receiver dial had to be in just the 'wrong' position to do this) and he subsequently redesigned this oversight.

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2/21

55 versus 85 degree LNA test; can you make a 'small dish' work better with a top-grade LNA? Microwave interference; can you build a 'better antenna' to cut-down on TI? See it here. **AND,** will SPACE survive the off-shore 'switch' for original equipment? Rick Brown discusses here on Boresight.

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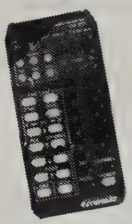

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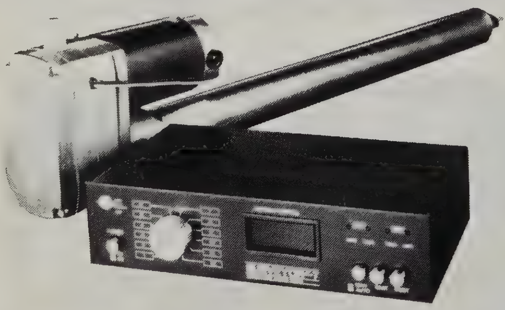

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own testing and measurement practices and I believe you will find the test results more meaningful in 1985 than perhaps they were in the past. In the year ahead, **if you are a dealer** having on-going problems with a particular brand and model of something, drop us a short note and tell us about the problem. If we had gotten enough dealer feedback about the Janeil BDC receiver, for example, months prior to when we finally woke up to the problem, we might have gotten on the job fast enough to report to dealers before so many got on the street and into the distribution chain. The dealer is our 'early warning' advance radar unit and we will continue to depend on that advanced warning to keep us all better informed.

CORRECTION

CSD for January 1 carried an equipment review for the COSMOS II receiver from Northwest SatLabs (see page 14). On page 26, we presented a set of 'specs' detailing performance for the unit. An unfortunate error crept into the line relating to 'Video Signal to Noise.' We wrote:

"**/ CSD measured 45 dB SNR with 23 dB CNR."

This line should have read:

****/ CSD measured 48 dB SNR with 10 dB CNR."**

We offer our apology to Northwest SatLabs for this unfortunate error.

NEW Networks

The December **Western Cable Television Show** in Anaheim, California was of particular interest to this industry because of the 'rash' of new or updated programming announcements. Yes, there are more specialty networks coming, during 1985, and that will mean even greater 'program choices' for the home TVRO owner.

The folks who have been occupying TR24 on F4 (**The Pacific Cable Network**) for several months are planning an expansion. Their service to date has been less than inspiring but they plan to branch out into more movies, more comedy shows and more talk shows. They have the concept of becoming "America's Fourth Network" although it may be difficult to figure out who is watching them, and why, at the present time. All it takes is bucks.

The Discovery Channel launched on Westar V back in mid-December. It programs 12 hours per day (3PM to 3AM eastern) and is trying to be advertiser supported. Their concept is to deal with human adventure, history, nature and travel; sort of a mix between the print media **'Discovery' Magazine** and **National Geographic.** And we wish them well, as well.

The Discovery Broadcasting System, not to be confused with The Discovery Channel, plans to launch during February a new (yes, another) 'music channel' which it will be marketing directly to UHF TV stations rather than cable. If the world does not need 'another' music channel, it may like having its first 'computer channel;' the Discovery Computer Network, now scheduled for mid-February launch with 24 hour per day service (six repeats of a single four-hour format). A Discovery Business Channel, something like FNN, is also on the drawing boards although FNN's cut-back in recent months (TR4, F3R) may signal a change in the business environment for business-directed services.

And then there is the long promised **Aloha Television Network,** a 24 hour per day service planning to activate TR22 on G1. The name gives this one away; everything you ever wanted to see or know or witness associated with 'Hawaii' will be here. The backers describe it as a 'giant, moving, picture post-card for Hawaii.' And there may well be a market for that sort of pap although it could start a trend that would end only when tiny Rhode Island gets its own transponder **(The Little Rhody Network).** That might be one way to reverse the sagging fortunes for satellite owners; go out and sell **each** of the states their very own transponder to tell the world how exciting and wonderful their state is. **It sounds like a Frank Ogden project to us.**

Then there is **'TV Decisions,'** a special channel planned for launch in February which will mix text graphic displays and promos for programs into a single 24 hour per day channel; kind of an 'Orbit-On-The-Tube.' If this one makes a go of things, anything will work!

While we may poke mild fun at some of these ventures, you have to keep in mind that **(1)** somebody is putting up real dollars in each case to 'test' a new concept in communications, and, **(2)** every new service that makes the grade after their 'test period' is one more

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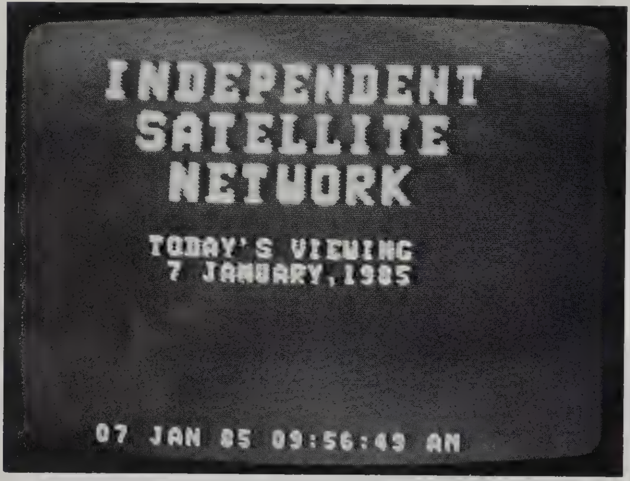
service to be added to the program guides and one more for you to pause over as you sweep through the belt and the receiver dial for a prospective customer. Who knows what makes up the 'perfect package' of programming for America? Stick around long enough, and we may eventually find out!

EUROPE/From North America?

In our July 1984 issue of **CSD** (see page 26; **'HBO in Tahiti?'**) we reported on the hemispheric coverage of Galaxy 1 (and 2) satellites and forecast that certain portions of western Europe (and Africa) would have 'access to' Galaxy 2 transmissions given the true nature of the Galaxy footprints. At the time there was limited 'testing' of video on G2 but no regular video. That has now changed and the news is good for those terminal operators and sellers located essentially west of a line drawn from Niamey, Niger (to the south, in Africa) north to at least Dublin, Ireland (on the north, in Europe). The 'included area' would cover the Azores Islands, most of Portugal, sections of (western) Spain and even significant portions of France.

G2 now has video. On both polarizations. Odd and even, horizontal and vertical.



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TODAY'S VIEWING
7 JANUARY,1985

07 JAN 85 09:56:49 AM
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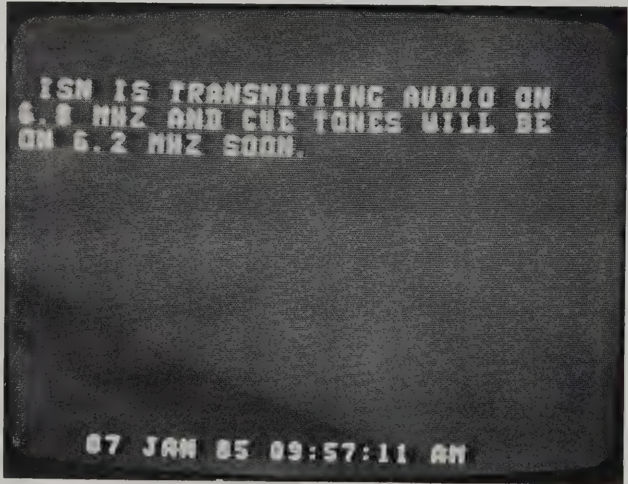
ISN/ Network ID

This combination will allow separate footprint or pattern checks for both polarizations on G2 (remember that G1, the 'companion Galaxy bird,' has a pattern which favors the odd number or horizontal polarized transponders). Calculations suggest that anyplace north-of 13 degrees north which has 'look angle visibility' to G2 should find the G2 signals on at least one of the two polarizations no less than 25 dBw; and that in theory would include the African and European locations indicated.



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ISN IS TRANSMITTING AUDIO ON
6.8 MHZ AND CUE TONES WILL BE
ON 6.2 MHZ SOON.

07 JAN 85 09:57:11 AM
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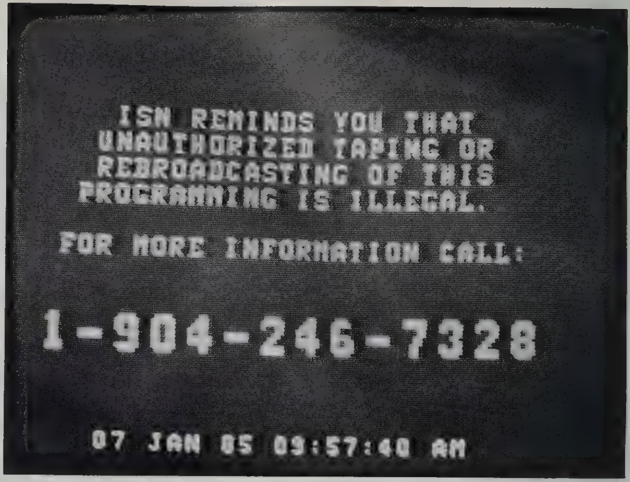
INTERNAL operating data for ISN



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REBROADCASTING OF THIS
PROGRAMMING IS ILLEGAL.

FOR MORE INFORMATION CALL:

1-904-246-7328

07 JAN 85 09:57:40 AM
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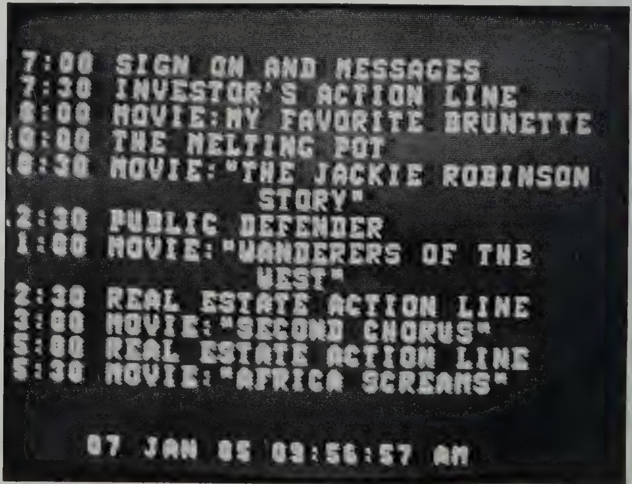
PERMISSION data for ISN

This is now possible because of a permanent test signal on Galaxy 2, TR18 (see photo here) and a new partial day service called **'Independent Satellite Network'** operating on TR15 of the same bird. (If the G1 pattern favoring stronger signals from the horizontal or odd numbered channels 'holds,' the ISN service on 15 should be the best of the two at the extremes of the footprint.)

The ISN service is approximately 12 hours per day (see partial day's schedule here) and as you can see from the display the service is heavily loaded with movies of the 'classic' era along with some semi-educational syndicated programs. The service does carry advertising and it provides significant chunks of 'between program' dead-air time for local 'affiliates' to mix in their own advertising as well. You can contact the people operating the service (904/246-7328) for information regarding becoming 'licensed' to carry the service through cable or over-the-air rebroadcast.

Reception results, from not only Europe and Africa but South America as well are solicited by **CSD.** Subsequent to our July 1984 report, **CSD** received extensive data from a terminal operator in **Quito, Ecuador** which indicates that the G1 services thought to be primarily 'north of 13 north' **are also** at very usable (above threshold) levels on a 30 foot dish in Quito. **If** the same pattern 'holds' for G2, there will be very few areas in South America which could not access the G2 service(s) now operational with the same type of equipment.



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 7:00 SIGN ON AND MESSAGES
 7:30 INVESTOR'S ACTION LINE
 8:00 MOVIE:MY FAVORITE BRUNETTE
 0:00 THE MELTING POT
 0:30 MOVIE:"THE JACKIE ROBINSON
             STORY"
 2:30 PUBLIC DEFENDER
 1:00 MOVIE:"WANDERERS OF THE
             WEST"
 2:30 REAL ESTATE ACTION LINE
 3:00 MOVIE:"SECOND CHORUS"
 5:00 REAL ESTATE ACTION LINE
 5:30 MOVIE:"AFRICA SCREAMS"

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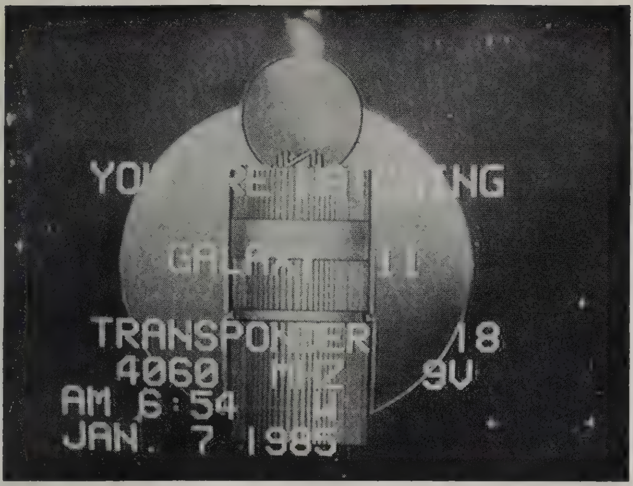
PARTIAL day schedule (daypart) **for ISN**



TEST SIGNAL on TR18, G2

SECAM To NTSC

This is primarily a plea for information. Someplace out there we have one or more readers who have either faced the problem to be outlined, and resolved it, or know of somebody who has done so.

Here is the problem. Russian and French satellite TV transmissions are in **SECAM** format. JVC **made** a nice multi-standards monitor which allowed you to view the SECAM color with typical SECAM color fidelity and you can still-photograph the scenes using standard 35MM techniques. **But,** if you attempt to **videotape** the SECAM video using an NTSC machine, you get a semi-lock on the vertical (a function of the machine chosen, which affects how good the vertical lock is) **and no color.** Naturally you would like full color.

Kenny Schaffer, in his Columbia University installation, pipes the Russian Molniya SECAM video all over the University by placing a color vidicon camera in front of a SECAM monitor and shooting the video off of the screen. It works, after a fashion, as viewers on my **Boresight** program segments will see later this spring. But, there is an annoying 50 hertz flicker which does not look good on a 60 hertz system and shooting video directly off a CRT, even with a 'light box' to make everything tidy and permanent, is not a very decent solution. We have forty to fifty hours of SECAM TV in the files we have shot this way and you can watch it for information, but a non-TV-phile quickly becomes distracted by the flicker.

There are several 'standards conversion' packages about which convert PAL to NTSC or NTSC to PAL or SECAM to PAL and so on. They are primarily available in the commercial 'standards conversion business' world and sell for $20K up per system. Way up in some cases.

LUXOR, in Europe for their Gorizont systems, builds a simplistic, functional, SECAM to PAL conversion board. The Russian TR1 minus European service from Gorizont is converted to PAL and then the PAL video feeds an (S)MATV modulator for distribution of the channel (with audio) to rooms in a hotel, for example. This is a 'cheap system' according to Luxor and I saw it work while in Sweden at the hotel where I stayed and admired its performance versus cost trade off. Unfortunately, LUXOR is not interested in a SECAM to NTSC conversion applying the same engineering direction since they see no market for such 'adapters.'

Possibly there is a conversion board for SECAM to NTSC about which is reasonably priced. If there is, I would appreciate hearing from a reader so we (and institutions such as Columbia) can get rid of our vidicon cameras scanning the SECAM video from the cathode ray tube faceplate and the annoying 50 hertz flicker at the same time!

A Warning

There is an increasingly steady-stream of visitors to the **CSD Lab Site** on Providenciales in the Turks and Caicos. From our industry. We have long ago ceased reporting on or writing about **each** such visitor since there are now several per month. Many come back to Provo to

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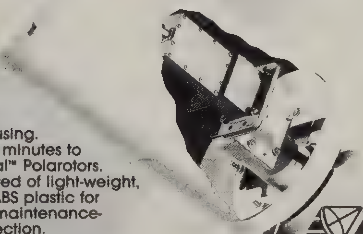

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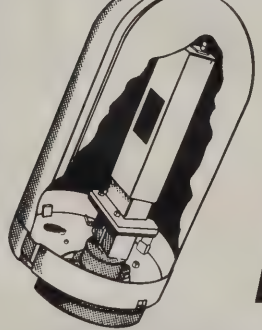

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DISGUSTING Club Med facility is down the beach and across Grace Bay from the WIV compound. But they wander a lot.

vacation after coming down the first time to bring equipment and knowledge to us. A comment or two is in order for those who have not been down for some time, or those who are still awaiting their first visit.

1) **Telephone service**/ is now vastly improved. In fact you can direct dial the Turks and Caicos from anyplace in the world and from the states we (at WIV-TV) are **1-809-946-4273.** Many of the 'WATTS Line' services even work to here. The connection 'levels' are not always good (we still shout alot!) but the service is there, less the operator interface, and that eliminates the 'human factor.'
2) **Air service** is vastly improved. **Cayman Air** (305/446-8696), a responsible modern airline, flies 727 or similar aircraft **directly** from Miami to Provo three days per week (Monday, Wednesday and Saturday at the present time). Round trip air fare is around $200 and the flight time is about 75 minutes. They serve a snack and drinks.
3) **Hotel service** is vastly improved. **Third Turtle Inn** (809/946-4230) is classy, small, and has excellent food. Rates for two people are in the $150 per night region. **Island Princess** (809/946-4260), close to WIV, is 'homey' and directly on the beach, medium sized and there is good 'action' there. Rates are lower than Third Turtle, meals included. **And then** there is 'Club Med.'

When we selected **our** beach front location more than five years ago, our beach area known as Grace Bay was totally devoid of habitation. It has been that way for most of those five years. But back on the 22nd of December the **Club Med** people opened their latest 300 room 'city' just 3/4's of a mile down the Grace Bay Beach. I of course had seen it coming and Club Med 'stories' had convinced me that I had better rush to get a 'fence' around our place before Club Med opened.

Depending upon your point of view, 'Medders' are either disgusting or 'enlightened.' **They don't wear any clothing.** None. They have the audacity to wander all over 'our beach' at all hours naked as jay birds cavorting in the sun and surf, chasing each other up and down the sand dunes, seemingly practicing to be a part in some giant **Playboy Channel** extravaganza. Disgusting.

In addition to the fully fenced 'compound' we are now forced to cower inside of, we allowed son Kevin to import a pair of Dobermans. Large Dobermans. The male was trained to attack 'low' and the female trained to attack 'lower.' Every now and again we send them out of the compound 'hunting' just to keep their skills honed to a find edge. They bring back some very interesting pieces of . . . well, property. Anything that flips and flops in the breeze is fair game for Greg and Jackie (the two Dobes). They've taught the '**Medders**' a thing or two.

Unfortunately you have to 'teach Medders' every seven days because Club Med insists on bringing two DC8s loaded with these disgusting people to Provo every Saturday. They pile off their chartered party-flight wearing sweaters and carrying heavy fur coats (the

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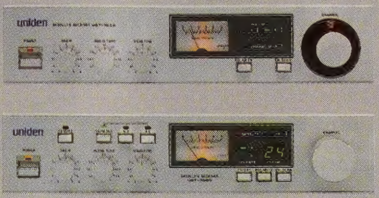

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JACKIE and Greg practicing to teach a 'Medder' **a lesson or two.**

flights originate in New York City) and begin 'shedding' their excess clothing even before they reach the end of the airplane ramp. By the time they get through immigration and customs they are down to the bare essentials, laughing and carrying on in a revolting manner. Then they pile into buses for the 15 minute trip to **'Le Club.'** I've timed them; it takes them about 17 minutes on the average to get checked in, shed whatever clothing they still have on, and be on 'our beach.' So we give them a day or two to adjust to the beach and then it's time for Jackie and Greg to take over. This repeats each week. Some fun.

I've considered videotaping all of this and selling it to Playboy. "Dangles In The Sun" might be an appropriate title. "Medders On The Run" is another possibility.

Marshall has been busy installing a security system for the 'WIV Compound' of late. The first time I saw a small herd of 'Medders' trying to scale our fence I knew we had to do something extra. We waited until they were in that never-never land between outside and inside and released the Dobes. Several left 'things' or 'parts of things' on the pointed metal tips at the top of the fence. There is something awesome about seeing two hungry Dobes charging you while you are balanced atop a fence. **'Take that you Medders.'** We have a humanitarian streak as well; the Dobes are confined to 'the compound' by the fence unless they are purposefully released. As the group of ten or so, both sexes, high-tailed it across the sand dunes we released the Dobes from the compound. Nobody has tried to scale the fence again. But next week there will be a new group 'to teach.'

Life in 'Paradise.' It is not the same as it was five years ago. Our telephones work pretty well, our food is fresher, our air service in and out works well. The hotels are full, everybody who wants to work has a job. And 'Medders' (bless their naked hearts) wander around in some sort of euphoric state soaking up our sun, sand and sea. **Be warned;** coming down here now is not the challenge it once was. Perhaps, as Daniel Boone once said, "It is time to move on because I can see the smoke from the next cabin."

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